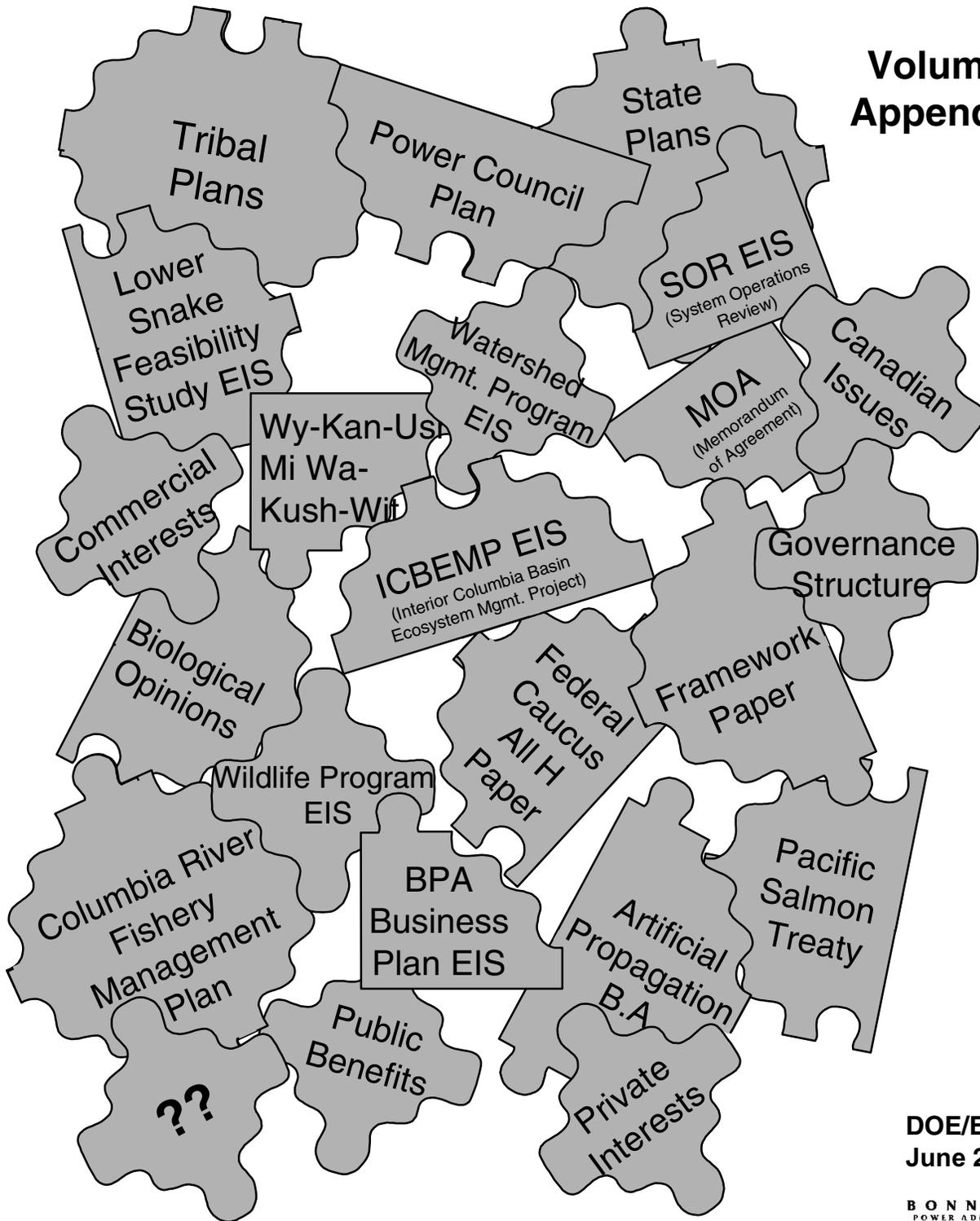


Bonneville Power Administration Fish & Wildlife Implementation Plan Draft EIS

"Piecing The Puzzle Together"

**Volume 2:
Appendices**



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Appendix A

FISH AND WILDLIFE FUNDING PRINCIPLES FOR BONNEVILLE POWER ADMINISTRATION RATES AND CONTRACTS

September 16, 1998

Preamble

The purpose of these principles is to conclude the fish and wildlife funding process in which Bonneville has been engaged with various interests in the Region, and provide a set of guidelines for structuring Bonneville's subscription and power rate processes. The principles are intended to "keep the options open" for future fish and wildlife decisions that are anticipated to be made in late 1999 on reconfiguration of the hydrosystem and in early 2000 on the Northwest Power Planning Council's Fish and Wildlife Program.

The agreement resulting from these principles is significantly different from the last Bonneville Fish and Wildlife Budget Memorandum of Agreement. Bonneville and the other participants are not establishing a budget for the 2002-2006 period, and Bonneville will not be picking a single number for the rate case.

These principles will ensure that Bonneville's rates and power contracts give a very high probability of meeting all post-2001 financial obligations, including the future fish and wildlife budget commitment, and that all these obligations can be met without creating a new contract and rate "cliff" at the end of the next 5-year rate period in 2006. Bonneville anticipates that after 1999 its fish and wildlife budget commitment for the post-2001 period will be set out in a budget agreement that, among other things, addresses accountability and provides that funds carried forward under the agreement will remain available for expenditure for the benefit of fish and wildlife.

Bonneville's contracts and rates historically have been set in a manner that assumes there is a low, but not zero probability that it will be unable to cover its costs. Continuing this approach, in such circumstances (e.g. low markets, low water, etc.) all of Bonneville's costs will be reviewed, recognizing that fish and wildlife obligations are one of its highest priorities. Guided by the principles below, Bonneville's goal is to reduce the chances of its being unable to cover its costs to an acceptably low level. Bonneville commits to use these principles and financial mechanisms to achieve this goal. These principles have been reviewed by the Office of Management and Budget and are consistent with the Administration's principles and priorities.

Principles

Bonneville will proceed with its power rate case and contracts for its subscription products for the period 2002-2006 using the following principles:

1. Bonneville will meet all of its fish and wildlife obligations once they have been established, including its trust and treaty responsibilities.
2. Bonneville will take into account the full range of potential fish and wildlife costs.
 - Bonneville will use the full range of potential fish and wildlife costs and financial impacts during the 2002-2006 rate period (currently estimated at \$438 million to \$721 million) for planning purposes. This range is based upon the current calculation of the 5 year average financial impact on Bonneville of thirteen long-term alternatives being evaluated in the Region for configuration of the Federal Columbia River Power System and an estimated range of costs for implementing the Northwest Power Planning Council's Fish and Wildlife Program to protect, mitigate, and enhance fish and wildlife on the Columbia River and its tributaries.
 - In setting its rates Bonneville will incorporate the range of \$438 million to \$721 million in its revenue requirement using a method that calculates probabilities across a range of costs in the same manner as Bonneville treats other cost and revenue uncertainties in its rate setting. Because of the uncertainties of the decisions on fish and wildlife at this time, Bonneville will conduct an analysis that assumes that all 13 system configuration alternatives are equally likely to occur. For the direct program, Bonneville will assume that costs have an equal probability of falling anywhere within the current range of \$100M - \$179M.
3. Bonneville will demonstrate a high probability of Treasury payment in full and on time over the 5-year rate period.
 - A 100 percent probability of Treasury payment is not achievable, but BPA's new rates must be designed to maintain or improve Treasury payment probability, even in view of the range of fish costs.
 - Bonneville will demonstrate a probability of Treasury payment in full and on time over the 5-year rate period at least equal to the 80 percent level established in the last rate case and will seek to achieve an 88 percent level.
4. Given the range of potential fish and wildlife costs, Bonneville will design rates and contracts which will position Bonneville to achieve similarly high Treasury payment probability for the post-2006 period by building financial reserve levels and through other mechanisms.

5. Bonneville will minimize rate impacts on Pacific Northwest power and transmission customers.
 - Bonneville’s goal is to avoid a wholesale rate increase for requirements customers (including small farm and residential customers of investor owned utilities) by seeking an additional cost reduction of \$130 million in internally manageable costs that are not fish and wildlife costs.
6. Bonneville will adopt rates and contract strategies that are easy to implement and administer.
7. Bonneville will adopt an approach that is flexible in order to respond to a variety of different fish and wildlife cost scenarios.
 - To create financial flexibility and to avoid another contract “cliff” in 2006, Bonneville's goal will be to have 35% to 45% of its total post-2001 power sales, including secondary sales, in contract terms of 3 years or less, in short-term surplus sales, and/or in cost-based indexed sales.
 - All sales to requirements customers will be renewable at cost-based rates which will reflect changes in Bonneville's costs subsequent to those reflected in the initial subscription rate.
8. Bonneville will use a combination of the following mechanisms to achieve principles 1-7. The specific mix and design of these mechanisms will be determined in the rate case and subscription process, but the mix chosen will meet the above principles:
 - Implementing prudent additional cost-reduction efforts to reduce internally manageable costs before exercising any contingent stranded cost recovery mechanism.
 - Use of Bonneville’s existing authorities if needed to implement stranded costs recovery on the transmission system, while simultaneously seeking more robust authorities legislatively.
 - Selling subscription products on staggered contract terms - some shorter than 5 years (see Principle 6) and some for longer than 5 years.
 - A cost recovery adjustment clause (CRAC) in power contracts for subscription customers.
 - An option fee from some customers in return for increased price predictability after the initial contract period.
 - Cost-based indexed pricing for some of its products.

- Using reserve balances carried into the 2002-2006 rate period from the prior period.

Administration Commitments

- The Administration will extend the availability of section 4(h)(10)(C) credits for Bonneville's costs related to its fish and wildlife programs for the period 2002-2006 on the same terms as established for the 1995-2001 period.
- The Administration will confirm continued access through 2006 to any funds remaining in the Fish Cost Contingency Fund on September 30, 2001 on the same terms as those established for the period 1995-2001.
- The Administration commits to support Bonneville in its Cost Review and revenue enhancement objectives.

Appendix B

MISSION STATEMENTS AND STATUTORY TABLES

This appendix is supplied to help understand the numerous different missions and legal requirements that guide the many entities involved in the region's fish and wildlife mitigation and recovery effort. Appendix B has two sections:

- Section A - The Major Stakeholders and Fish and Wildlife Policy Forums
- Section B - Relevant Federal Statutes, Regulations and Executive Orders.

Section A

The Major Stakeholders and Fish And Wildlife Policy Forums in the BPA Service Area

Numerous stakeholders influence fish and wildlife policies and program implementation within the BPA Service Area. They include multiple sovereignties and levels of government, as well as interagency forums and independent commissions. Their activities in the fish and wildlife arena are linked by varying degrees of coordination, and their missions reflect their geographic locations and constituents. The following table provides the reader with a sense of the breadth and diversity of the major interest groups concerned with BPA's Fish and Wildlife Implementation Program.

Canada	
Fisheries and Oceans Canada	Responsible for policies and programs to support Canada's interests in the oceans and freshwater habitat, and to conserve and sustain Canada's fisheries resources in marine and inland waters.
United States—Federal Agencies	
U.S. Department of Agriculture	
U.S. Forest Service	Manages national forests and grasslands in all eight states in BPA service area for sustainable multiple use, including fish and wildlife.
Natural Resources Conservation Service	Provides assistance about soil and water conservation to private landowners. Has a conservation office in every county.
U.S. Department of Commerce	
National Marine Fisheries Service	Responsible for managing and sustaining most marine resources and their habitats in U.S. waters. Provides services to support domestic and international fisheries management.
U.S. Army Corps of Engineers	
Army Corps of Engineers	Operates federal dams in the Columbia River basin for multiple uses, including fish and wildlife. Salmon migrate through fishways and bypass systems at most dams.

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U.S. Department of Energy	
Bonneville Power Administration	Responsibilities include improvement of Northwest fish and wildlife resources affected by hydropower plants in the Columbia River Basin.
Environmental Protection Agency	Responsible for safeguarding the nation's natural environment - air, water, and land.
U.S. Department of the Interior	
Bureau of Land Management	Manages public lands, including fish and wildlife habitat.
Bureau of Reclamation	Manages, develops, and protects water and related resources
National Park Service	Responsible for preserving natural resources in national parks.
Fish and Wildlife Service	Responsible for conserving, protecting, and enhancing fish and wildlife, and their habitats. Specifically includes migratory birds, endangered species, certain marine mammals, and freshwater and anadromous fish.
United States— State Governments	
California Dept. of Fish and Game	Responsible for managing California's fish, wildlife, and plant resources, and the habitat upon which they depend.
Idaho Dept. of Fish and Game	Responsible for preserving, protecting, and perpetuating all fish and wildlife resources in Idaho.
Montana Fish, Wildlife & Parks	Responsible for maintaining and enhancing the health of Montana's natural environment and the vitality of its fish and wildlife resources.
Oregon Dept. of Fish and Wildlife	Responsible for protecting and enhancing Oregon's fish and wildlife and their habitats for use and enjoyment by present and future generations.
Nevada Dept. of Conservation and Natural Resources	Responsible for protecting, preserving, managing, and restoring wildlife and its habitat.
Utah Dept. of Natural Resources	Responsible for coordinated and balanced stewardship of Utah's natural resources.
Washington Dept. of Fish and Wildlife	Responsible for providing sound stewardship of fish and wildlife. Serves as an advocate for fish and wildlife species.
Wyoming Game and Fish Dept.	Responsible for providing adequate and flexible system to control, propagate, manage, protect, and regulate all Wyoming wildlife.
Tribes	
Blackfoot Tribe	Reservation, 3,000 square miles Northwestern Montana 8,488 tribal members

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Burns-Paiute Tribe	Reservation, 1,240 acres plus 11,000 acres in trust for individual Indians Eastern Oregon 286 tribal members
Cedarville Rancheria	Reservation, 20 acres Northwestern California Population: 22
Confederated Tribes of the Chehalis Indian Reservation	Reservation, 4,224 acres Western Washington Number of Chehalis Indians in 1984: 382.
Chinook Indian Tribe	No reservation or tribal lands Western Washington 2,000 tribal members
Coeur d'Alene Tribe	Reservation, 69,299 acres Northern Idaho 1,216 tribal members
Confederated Tribes of the Colville Reservation	Reservation, 1.3 million acres Northeastern Washington 7,900 tribal members
Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians	Reservation, 6.1 acres South-central Oregon coast 600 tribal members
Coquille Indian Tribe	No reservation 6,400 acres of tribal lands South-central Oregon coast 695 tribal members
Cowlitz Indian Tribe	No reservation Western Washington 1,400 tribal members
Crow Indian Nation	Reservation, 3,521 square miles South-central Montana 9,024 tribal members
Fort Bidwell Reservation	Reservation, 3,335 acres Northwestern California Population: 200

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Fort McDermitt Paiute and Shoshone Tribe	Reservation, 16,654 acres in northern Nevada; 18,828 acres in southeastern Oregon
Confederated Tribes of the Grand Ronde	Reservation, 10,300 acres Western Oregon 4,104 tribal members
Hoh Tribal Business Community	Reservation, 443 acres Northern Washington coast 212 tribal members
Hoopa Valley Reservation	Reservation, 85,446 acres Northwestern California Population: 2,200
Jamestown S'Kallam Tribal Council	No reservation Northwestern Washington 486 tribal members
Kalispel Tribe	Reservation, 4,600 acres Northeastern Washington 250 tribal members
Klamath Tribes	No reservation or tribal lands South-central Oregon 3,175 tribal members
Kootenai Tribe of Idaho	Reservation, 2,695 acres Northern Idaho 165 tribal members
Lower Elwha	Reservation, 373 acres Northwestern Washington 638 tribal members
Lummi Indian Tribe	Reservation, 12,000 acres Northwestern Washington 3,670 tribal members
Makah Tribe	Reservation, 27,200 acres Northwestern Washington 2,195 tribal members
Muckleshoot Tribe	Reservation, 1,201 acres of trust land Western Washington 1,170 tribal members

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Nez Perce Tribe	Reservation, 88,000 acres North-central Idaho 3,000 tribal members
Nisqually Indian Tribe	No reservation or tribal lands Western Washington 500 tribal members
Nooksack Indian Tribe	Reservation, 2,500 acres including 65 acres of tribally owned trust land Western Washington 1,341 tribal members
Ozette/LaPush Tribes	Reservation, 709 acres Northern Washington coast (Held in trust for the Makah Tribe)
Pit River Indians	Several reservations, Northeastern California 1,350 tribal members
Port Gamble S'Klallam	Reservation, 1,341 acres Northern Washington coast 935 tribal members
Puyallup Indian Tribe	Reservation, a few square miles Western Washington 2,219 tribal members
Quileute Tribe	Reservation, 594 acres Northern Washington coast 706 tribal members
Quinault Indian Nation	Reservation, 189,621 acres Northwestern Washington 2,453 tribal members
Confederation Tribes of the Salish and Kootenai Tribes of the Flathead	Reservation, 1.2 million acres Western Montana 6,800 tribal members
Samish Tribe	No reservation or tribal lands Western Washington 750 tribal members

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Sauk-Suiattle Tribe	Reservation, 23 acres Northwestern Washington 183 tribal members
Shoalwater Bay Tribe	Reservation, 1,035 acres Northwestern Washington 204 tribal members
Northwestern Band of Shoshoni Nation	Reservation, 187 acres Northwestern Utah 411 tribal members
Shoshone-Bannock Tribes of Fort Hall	Reservation, 540,764 acres Idaho 3,951 tribal members
Shoshone-Paiute Tribes of the Duck Valley Reservation	Reservation, 144,274 acres in Nevada Reservation, 145,545 acres in Idaho
Confederated Tribes of the Siletz Indian Reservation	Reservation, 3,669 acres Western Oregon 3,022 tribal members
Skokomish Tribe	No reservation or tribal lands Northwest Washington 796 tribal members
Spokane Tribe	Reservation, 154,000 acres Eastern Washington 2,100 tribal members
Squaxin Island Tribe	Reservation, a small island Western Washington 650 tribal members
Stillaguamish Tribe	No reservation or tribal lands Western Washington 237 tribal members
Summit Lake Paiute Tribe	Reservation, 10,098 acres Nevada
Suquamish Tribe	Reservation, 2,500 acres Northwestern Washington 665 tribal members

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Swinomish Indian Tribe	Reservation, 10 square miles Western Washington 778 tribal members
Tulalip Indian Tribe	Reservation, 8,878 acres Northwestern Washington 2,800 tribal members
Confederated Tribes of the Umatilla Indian Reservation	Reservation, 157,982 acres Eastern Oregon Approximately 2,000 tribal members
Upper Skagit Tribe	Reservation, 99 acres Western Washington 504 tribal members
Confederated Tribes of Warm Springs	Reservation, 641,000 acres Central Oregon 3,755 tribal members
Confederated Tribes and Bands of the Yakama Indian Nation	Reservation, 1.4 million acres South-central Washington 8,870 tribal members
Tribal Coalitions	
Affiliated Tribes of Northwest Indians	Nonprofit organization dedicated to tribal sovereignty and self-determination. Represents 54 Northwest tribal governments.
Columbia River Inter-Tribal Fish Commission	Provides technical support and coordination for the four Columbia River treaty tribes. Members are fish and wildlife management representatives from the tribes.
Northwest Indian Fisheries Commission	Assists tribes in conducting coordinated, biologically sound fisheries management and provides a unified voice about fisheries issues. Members represent 19 western Washington tribes.
Upper Columbia United Tribes	Composed of four tribes. Provides ecological training and studies about fisheries issues.
Other Entities	
Columbia Basin Fish and Wildlife Authority	Represents Oregon, Washington, Idaho, and Montana, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and 13 tribes of the Columbia River Basin. Members are responsible for coordinating interagency and tribal fish and wildlife efforts.
Dissolved Gas Team	Researches and develops measures to abate gas bubble disease (in fish) associated with spill at Columbia River dams. Members represent federal agencies, state agencies, utilities, fisheries interest groups, and tribes.

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Executive Committee	Coordinates implementation of the Endangered Species Act, Northwest Power Act, and other statutory programs for anadromous fish in the Columbia River basin. Members represent federal, state, and tribal entities.
Fish Passage Center	Provides current and historical data about salmon and steelhead passage through the Snake and Columbia river basins.
Implementation Team	Provides a mechanism for coordinating and implementing biological opinions from the National Marine Fisheries Service concerning the federal dams in the Columbia River basin. Members represent federal agencies, states, tribes, and utilities.
Independent Scientific Advisory Board	Provides scientific advice and recommendations about fish and wildlife issues in the Columbia River basin.
International Pacific Halibut Commission	Reviews all U.S. and Canadian regulatory proposals concerning the halibut fishery in the North Pacific Ocean and Bering Sea, and submits recommendations to Canadian and U.S. governments.
Northwest Power Planning Council	Represents Idaho, Oregon, Montana, and Washington to oversee the federal power system planning, and fish and wildlife recovery in the Columbia River basin.
Pacific Fisheries Management Council	Develops fishery management plans for salmon, groundfish, and coastal pelagic species off the coasts of Washington, Oregon, and California. A cooperative effort among states, federal agencies, and tribes.
Pacific Salmon Commission	Formed by the governments of Canada and the United States to implement the Pacific Salmon Treaty. Provides a forum for both countries to resolve salmon management issues.
Pacific States Marine Fisheries Commission	Serves as a forum for discussion about fisheries issues and works for consensus among state and federal agencies. Represents California, Oregon, Washington, Idaho, and Alaska.
Plan for Analyzing and Testing Planning Group	Coordinates regional fish passage and life cycle models and tests the hypotheses about the models to address fish management issues. Members represent federal and state agencies, universities, consultants, and tribes.
Snake River Compact	An agreement between Wyoming and Idaho to allocate waters of the Snake River.
System Configuration Team	Develops proposals, plans, and budget priorities for physical improvements to dams and dam-related structures. Members include the Northwest Power Planning Council, federal and state fish and wildlife agencies, and Columbia River basin tribes.
Technical Management Team	Makes recommendations to operating agencies about dam and reservoir operations to optimize fish passage conditions. An inter-agency team chaired by U.S. Army Corps of Engineers.
Western Systems Coordinating Council	Regional forum to promote electric service reliability in western U.S., Canada, and Mexico.

Section B

Relevant Federal Statutes, Regulations, and Executive Orders

<p>BPA - Bonneville Power Administration BLM - Bureau of Land Management BOR - US Bureau of Reclamation CEQ - President's Council of Environmental Quality COE - US Army Corps of Engineers DOC - US Department of Commerce DOI - US Department of Interior</p>	<p>NMFS - National Marine Fisheries Service NPS - National Park Service EPA - US Environmental Protection Agency USDA - US Department of Agriculture USFS - US Forest Service USFWS - US Fish and Wildlife Service</p>
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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
American Indian Religious Freedom Act of 1978, 42 U.S.C.S. 1996 (1999)	Same as complying agencies	All federal agencies with statutory or administrative responsibilities for management of federal lands	To protect and preserve the American Indians' inherent right to believe, express, and exercise their traditional religion, including access to sites, use and possession of sacred objects, worship through ceremonials, traditional rites.
Archeological and Historic Preservation Act of 1960 and 1974 16 U.S.C.S. 469 <i>et seq.</i> (1999)	DOI	Any agency constructing a dam or other Federal construction project	Provides for preservation of historic sites, buildings, objects, etc. by providing for preservation of historical and archeological data which might otherwise be irreparably lost or destroyed as the result of flooding, relocation of roads, alterations of terrain, or other acts cause by the construction of a dam by any agency of U.S. or by any private entity holding license issued by such agency or by any alteration of the terrain caused as a result of any Federal construction project or federally licensed activity or program.
Archeological Resources Protection Act, 16 U.S.C.S. 470aa <i>et seq.</i> (1999)	Agency with primary management authority of public lands or DOI	All	Agencies must obtain permits before excavating or otherwise disturbing archaeological resources on public lands and Indian lands.
Bald Eagle Protection Act 16 U.S.C.S. 668 (1999)	USFWS, DOI, Attorney General	All	No one is allowed to take, possess, sell, purchase bald eagle or golden eagle, dead or alive, or any part, nest or egg thereof.

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
Clean Air Act, as amended, 42 U.S.C.A. 7401 <i>et seq.</i> (1999)	EPA	All	Agencies must comply with state implementation plans, and follow new source performance standards as required by EPA. Must comply with all federal, state, interstate, and local air pollution requirements.
Clean Water Act, as amended, 33 U.S.C.S. 1251 <i>et seq.</i> (1999). (Federal Water Pollution Control Act of 1972 and its successors, the Clean Water Act of 1977, and the Water Quality Act of 1987)	EPA	All	Regulates discharge of pollutants into the navigable waters of the U.S. through a permit system. Non-point source requirements control pesticide runoff, agricultural runoff, forestry operations, and parking lots/motor pools. Non-point sources require individual or group permits and must be monitored at the point they enter public waters, storm sewers, or natural waterways.
Coastal Zone Management Act of 1972, as amended, 16 U.S.C.S. 1451 (1999)	USDC	All	Requires that federal actions are consistent, to the maximum extent practicable, with approved state Coastal Zone Management programs.
Columbia River Gorge National Scenic Area Act, as amended, 16 U.S.C.S. § 544 <i>et seq.</i> (1999)	Columbia River Gorge Commission	All	A violation occurs if there is a willful violation of management plans, land use ordinances or implementation measures made by the Columbia Gorge Commission.
Comprehensive Environmental Response, Compensation & Liability Act of 1980 (CERCLA), as amended, 42 U.S.C.S. 9601 <i>et seq.</i> (1999)	EPA	All	Requires restoration of sites with hazardous materials.
Endangered Species Act (ESA), as amended, 16 U.S.C.S. 1531 <i>et seq.</i> (1999)	NMFS, USFWS	Virtually all	Federal agencies must ensure that proposed actions do not jeopardize the continued existence of any endangered or threatened species, or cause the destruction or adverse modification of their habitat.

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
Environmental Quality Improvement Act of 1970, as amended, 42 U.S.C.S. 4371 <i>et seq.</i>	CEQ and Office of Environmental Quality	All federal agencies conducting or supporting public works projects	Federal agencies must comply with environmental statutes.
Executive Order 11514 Protection and Enhancement of Environmental Quality, Mar. 5, 1970, 3 C.F.R. 902 (1966-1970), 35 Fed. Reg. 30,959 (Amended by Executive Order 11991, May 24, 1977, 3 C.F.R. 123 (1977), 42 Fed. Reg. 26,967)	CEQ	All	Directs Federal agencies to initiate measures needed to direct their policies, plans, and programs to meet national environmental goals. Federal agencies are responsible for developing procedures (e.g., public hearings, information on alternative courses of action) to ensure the public can review, understand, and comment on Federal plans and programs with environmental impacts in a timely manner. The Council on Environmental Quality (CEQ) developed regulations requiring EISs to be more concise, clear, and to the point (and therefore more useful to the decisionmakers) in response to this executive order.
Executive Order 11644 Use of Off-Road Vehicles on Public Lands, Feb. 8, 1972, 37 Fed. Reg. 2877, as amended by Executive Order 11989, May 24, 1977, 42 Fed. Reg. 26,959	DOI, USDA	BLM, USFS	Establishes policies and procedures for use of off-road vehicles on public land to protect resources of those lands. Includes any vehicle whose use is authorized by respective agency head under permit, license, lease or contract.
Executive Order 11988 Floodplain Management, May 24, 1977, 3 C.F.R. 117 (1977) 42 Fed. Reg. 26961. Amended by Executive Order 12148, July 12, 1975, 3 C.F.R. 412 (1979), 44 Fed. Reg. 43,239	Water Resources Council	BLM, USFS	Federal agencies are required to avoid or minimize adverse impacts associated with short-term or long-term modification and occupancy of flood plains. If activities are going to occur within the 100-year floodplain or within wetlands the agency must first prepare a floodplain/wetlands assessment (similar to NEPA requirements).
Executive Order 11990 Protection of Wetlands, May 24, 1977, 3 C.F.R. 121 (1977), 42 Fed. Reg. 26,961	Each agency	All	Federal agencies are required to issue or amend existing procedures to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
<p>Executive Order 12088 Federal Compliance with Pollution Control Standards, Oct 13, 1978, 3 C.F.R. 243 (1978), 43 Fed. Reg. 47,707, (amended by Executive Order 12580, Jan. 12, 1987, 3 C.F.R. 103 (1987), 52 Fed. Reg. 2423, amended by Executive Order 13016, Aug. 28, 1996, 61 Fed. Reg. 45871)</p>	<p>EPA</p>	<p>All</p>	<p>This executive order delegates responsibility to the head of each executive agency for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution. This order gives the EPA authority to conduct reviews and inspections to monitor Federal facility compliance with pollution control standards.</p>
<p>Executive Order 12898 Environmental Justice, Feb. 11, 1994, 59 Fed. Reg. 7629, amended by Executive Order 12948, Jan. 30, 1995, 60 Fed. Reg. 6381.</p>	<p>Interagency Working Group on Environmental Justice convened by EPA</p>	<p>All</p>	<p>Directs all federal agencies to ensure that their actions do not result in disproportionately adverse environmental or human health effects on minority and/or low-income populations. In addition, federal agencies must analyze the environmental effects of the actions, including human health, economic, and social effects, and effects on minority and low-income communities.</p>
<p>Executive Order 12962 Recreational Fisheries, June 7, 1995, 60 Fed. Reg. 30769</p>	<p>USFWS, NMFS</p>	<p>All</p>	<p>Requires federal agencies to implement laws in manner that will conserve, restore, and enhance aquatic systems that support recreational fisheries; to evaluate the effects of federal funded, permitted, or authorized actions on aquatic systems and recreational fisheries; documents those effects.</p>
<p>Farmland Protection Policy Act 7, as amended, U.S.C.S. 4201 <i>et seq.</i> (1999)</p>	<p>USDA</p>	<p>All</p>	<p>Directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The Act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses.</p>

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Federal Insecticide, Fungicide, and Rodenticide Act, as amended 7 U.S.C.S. 136 <i>et seq.</i> (1999) (amended by the Federal Environmental Pesticide Control Act of 1972)	EPA	All	Registers and regulates the manufacture and use of pesticides, including herbicides.
Federal Land Policy and Management Act 43, U.S.C.S. 1701 <i>et seq.</i> (1999)	BLM, USFS	Agencies with federal land management responsibilities	Establishes public land policy and guidelines for its administration and provides for the management, protection, development, and enhancement of the public lands. Requires permits for right-of-way access for activities not in accord with the primary objective of the management of public or Indian lands under the Act.
Fish and Wildlife Act of 1965 PL 85-624, 16 U.S.C.S. 742 <i>et seq.</i> (1999).	USFWS, NMFS (if appropriate), state agencies with jurisdiction over wildlife resources	Any federal agency that proposes to control or modify any body of water	Authorizes the Secretary of the Interior to take steps required for the development, management, advancement, conservation, and protection of fisheries and wildlife resources through research, acquisition of refuge lands, development of existing facilities, and other means. Designed to protect the aquatic environment as it affects fish and wildlife resources. Wildlife conservation should receive equal consideration and be coordinated with other aspects of water resources development.
Fish and Wildlife Conservation Act of 1980, 16 U.S.C.S. 2901 <i>et seq.</i> (1999)	DOI	All	Encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats
Fish and Wildlife Coordination Act, as amended, 16 U.S.C.S. 661 <i>et seq.</i> (1999)	USFWS, NMFS, (if appropriate), DOI, state agencies with jurisdiction over wildlife resources	Any federal agency that proposes to control or modify any body of water	Designed to protect the aquatic environment as it affects fish and wildlife resources. Wildlife conservation should receive equal consideration and be coordinated with other aspects of water resources development.

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
Forest and Rangeland Renewable Resources Planning Act of 1974, as amended, 16 U.S.C.S. sec. 1600 <i>et seq.</i> (1999) (National Forest Management Act of 1976, 16 U.S.C.S. 1600 <i>et seq.</i> (1999))	USDA	BLM, USFS	Requires Federal agencies to develop resource management plans on land affected by their actions. Includes Forest Management Plans.
Magnuson-Stevens Fishery Conservation and Management (Sustainable Fisheries Act of 1996), Act. 16 U.S.C.S. 1801 <i>et seq.</i> (1999)	NMFS	All	Development of regional fishery management plans for off-shore fisheries, anadromous species and Continental Shelf fisheries. Promote protection of essential fish habitat in review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat.
Marine Mammal Protection Act, 16 U.S.C.S. 1361 <i>et seq.</i> (1972)	NMFS	All	Established moratorium, with exemptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas.
Migratory Bird Treaty Act of 1918, 16 U.S.C.S. 703 <i>et seq.</i> (1999).	USFWS	All	An activity violates the Act if the action can kill or take a migratory bird. If the action is unavoidable, a permit can be obtained from the Fish and Wildlife Service.
National Environmental Policy Act (NEPA), as amended, 42 U.S.C.S.4321 <i>et seq.</i>	EPA	Applies to all federal projects or projects that require federal involvement.	Requires Federal agencies to assess the impacts that their proposed actions may have on the environment.
National Historic Preservation Act of 1966, as amended, 16 U.S.C.S. 470 <i>et seq.</i> (1999)	DOI, NPS, states	All	Requires the agency official consider the effects an undertaking may have on historic properties and provide an opportunity for the State Historic Preservation Officer (SHPO) and/or the Advisory Council (AC) to comment on such effects.
National Trail System Act , 16 U.S.C.S. 1241 <i>et seq.</i> (1999)	DOI, USDA	BLM, USFS, BPA	Establishes and protects trails in urban areas and in scenic areas and along historic travel routes. Designates the Oregon National Historic Trail. Provides for additional national scenic or

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
			historical trails. Violations are designated by the agency that manages the area. Includes such regulations as requiring permits when burning or making unreasonable disturbances, or requiring special-use authorization for construction and maintenance in the area.
National Wildlife Refuge Administration Act, as amended, 16 U.S.C.S. 668dd (1999)	DOI (BLM, USFWS)	All	Protects designated wildlife refuges areas. Several are listed in Oregon and Washington.
Native American Graves Protection and Repatriation Act (ARPA) of 1990, 25 U.S.C.S. 3001 <i>et seq.</i> (1999)	DOI	All	Prior to intentional removal of Native American grave remains, obtain an ARPA permit and consult with tribes. When gravesites unintentionally disturbed, halt work immediately, consult land management entity, and consult with tribes. Activity may resume 30 days after confirmation of notification to tribes.
Noise Control Act of 1972, as amended, 42 U.S.C.S. 4901 <i>et seq.</i> (1999)	EPA	All	Requires that federal entities comply with state and local requirements regarding noise. Requires all federal agencies to correct and abate any environmental noise in violation of EPA standards.
Noise Pollution and Abatement Act of 1970, 42 U.S.C.S. 7642 (1999)	EPA	All	Federal agency carrying out or sponsoring activity resulting in noise that is determined to be public nuisance shall abate such noise.
Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) 16 U.S.C.S. 839 <i>et seq.</i> (1999)	Pacific Northwest Power and Conservation Planning Council, DOE	BPA, FERC, BOR, COE, NMFS, USFWS	Contains provisions to protect, mitigate, and enhance the fish and wildlife, including their spawning grounds and habitat, of the Columbia River and its tributaries.
Pollution Prevention Act of 1990, 42 U.S.C.S. 13101 <i>et seq.</i> (1999)	EPA	All	Prevent pollution through source reduction practices.

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
<p>Reservoir Salvage Act of 1960. 16 U.S.C.S 469 <i>et seq.</i> (amended by the Archeological and Historic Preservation Act, see above) to extend the provisions of the 1960 Act to all Federal construction activities and all federally licensed/assisted activities that cause loss of scientific, prehistoric, or archeological data</p>	<p>DOI</p>	<p>All</p>	<p>The act requires Federal agencies building or permitting the building of reservoirs to notify the Secretary of the Interior when such activities might destroy important archaeological, historic, or scientific data. That Secretary is authorized to conduct appropriate investigations to protect those data. The act also authorizes agencies to spend up to 1 percent of their construction funds on the protection of historic and archaeological resources. In 1974, the Reservoir Salvage Act was amended by the Archeological and Historic Preservation Act to extend the provisions of the 1960 Act to all Federal construction activities and all federally licensed or assisted activities that cause loss of scientific, prehistoric, or archeological data.</p>
<p>Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C.S. 6910 <i>et seq.</i> (1999) (Solid Waste Disposal Act)</p>	<p>EPA</p>	<p>All</p>	<p>Regulates the storage, use and disposal of solid and hazardous wastes. Imposes requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal (TSD) facilities.</p>
<p>Rivers and Harbors Act of 1938, as amended, 33 U.S.C.S. 540 <i>et seq.</i> (1999)</p>	<p>COE</p>	<p>Any agency involved in waterway improvements</p>	<p>If a proposed action includes a structure or work in, under, or over a navigable water of the US; Structure or work affecting a navigable water of the US; or the deposit of fill material or an excavation that in any manner alters or modifies the course, location, or capacity of any navigable water of the US, a permit is required from the Corps. Activities shall include a due regard for wildlife conservation.</p>

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
Rivers and Harbors Appropriations Act of 1899, as amended, 33 U.S.C.S. 401 <i>et seq.</i> (1999)	COE	All	Requires consent of Congress and approval from the Corps for construction of bridge, causeway, dam or dike over or in port, navigable river or other navigable waters.
Safe Drinking Water Act as amended, 42 U.S.C.S. 300f <i>et seq.</i> (1999)	EPA	All	Applies to public water systems. Act specifies contaminants that may have adverse health effects, and contains criteria and procedures to assure a supply of drinking water that complies with established maximum permissible contamination levels.
Soil and Water Resources Conservation Act of 1977, as amended, 16 U.S.C.S. 2001 <i>et seq.</i> (1999)	USDA	BLM, USFS, all USDA programs	Provides for program to conserve, protect and enhance soil, water and related resources (within scope of Department of Agriculture programs).
Surface Mining Control and Reclamation Act of 1977, 30 U.S.C.S. 1201 <i>et seq.</i> (1999)	DOI: Office of Surface Mining Reclamation and Enforcement		Focus mostly on coal but seems to include surface mining of other minerals. Provides for reclamation of mined areas that prevent or damage beneficial use of land or water resources or endanger health or safety of the public.
Taylor Grazing Act, as amended, 43 U.S.C.S. 315 <i>et seq.</i> (1999)	DOI	BLM, USFS	To preserve grazing land and its resources from destruction or unnecessary injury; defines grazing rights and protects them by regulation.
Toxic Substances Control Act, as amended, 15 U.S.C.S. 2601 <i>et seq.</i> (1999)	EPA	All	Intended to protect human health and the environment from toxic chemicals. Regulation of toxic chemicals including methods of use and disposal and protection of employees.
Water Bank Act as amended, 16 U.S.C.S. 1301 <i>et seq.</i> (1999)	USDA in coordination with DOI	Implementing agencies	Establishes program to prevent serious loss of wetlands and the preserve, restore and improve such lands through conservation agreements with property owners.
Watershed Protection and Flood Prevention Act as amended, 16 U.S.C.S. 1001 <i>et seq.</i>	USDA	All	Prevention of erosion, floodwater, and sediment damages in watersheds of rivers of U.S.; furthering the

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Statute or Order	Administering Agencies	Complying Agencies	Statutory Requirements
(1999)			conservation, development, use, and disposal of water, and the conservation and use of land and thereby preserving, protecting, and improving the nation's land and water resources and the quality of the environment. Federal agencies cooperate with and assist states and local governments.
Wild and Scenic Rivers Act PL90-542, 16 U.S.C.S. 1270 <i>et seq.</i> (1999)	DOI, USDA	BLM, USFS, COE, BPA	Provides for preservation of designated rivers. Rivers are managed to preserve their natural qualities, with recreational opportunities reduced to prevent deterioration of the environment. Incompatible development in the river corridor or in areas directly affecting the river is prohibited. Listed rivers or river segments in Idaho, Oregon and Washington.
Wilderness Act, as amended, 16 U.S.C.S. 1131 <i>et seq.</i> (1999)	USDA, USFS	All	There can be no settlement, mechanized activities or commercial development within designated wilderness areas.

Appendix C

THREATENED AND ENDANGERED FISH AND WILDLIFE SPECIES IN THE BPA SERVICE AREA: LISTING AND LEGAL PROTECTIONS

The following tables provide information on those plant and animal species in the BPA Service Territory that are listed as endangered and threatened under the federal Endangered Species Act. Table A lists the types of species and provides information regarding their listing status and region. Table B identifies the legal documentation that provides the listed species with protection.

Table A: Federally-Listed Threatened and Endangered Species in the BPA Service Area (As of April 2001).

SPECIES TYPE	COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ¹	STATE IN WHICH LISTED
BIRDS	Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	ID, MT, NV, OR, UT, WA, WY
	Brown Pelican	<i>Pelecanus occidentalis</i>	E	OR, WA
	Marbled Murrelet	<i>Brachyramphus marmoratus marmoratus</i>	T	OR, WA
	Mountain Plover	<i>Charadrius montanus</i>	PT	MT, NV, UT, WY
	Northern Spotted Owl	<i>Strix occidentalis caurina</i>	T	OR, WA
	Piping Plover	<i>Charadrius melodus</i>	T	MT
	Short-tailed Albatross	<i>Phoebastria albatrus</i>	E	OR, WA
	Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	T	OR, WA
	Whooping Crane	<i>Grus americana</i>	EXPN	ID, UT, WY
Whooping Crane	<i>Grus americana</i>	E	MT	
INSECTS	Oregon Silverspot Butterfly	<i>Speyeria zerene hippolyta</i>	T	OR, WA
	Fender's Blue Butterfly	<i>Icaricia icarioides fenderi</i>	E	OR
FISH	Borax Lake Chub	<i>Gila boraxobius</i>	E	OR
	Bull Trout	<i>Salvelinus confluentus</i>	T	ID, MT, NV, OR, WA
	Chinook Salmon (Snake R., Tucannon R., Grande Ronde R., Imnaha R., Salmon R., and Clearwater R. [All Fall Only])	<i>Oncorhynchus tshawytscha</i>	T	ID, OR, WA
	Chinook Salmon (Snake R., Tucannon R., Grande Ronde R., Imnaha R., and Salmon R. [All Spring/Summer])	<i>Oncorhynchus tshawytscha</i>	T	ID, OR, WA
	Chinook Salmon (Puget Sound, Upper Columbia R., Upper White Salmon R., Upper Clackamas R. [Fall/Summer], and Upper Willamette R.)	<i>Oncorhynchus tshawytscha</i>	T	OR, WA
	Chinook Salmon (Lower Columbia R.)	<i>Oncorhynchus tshawytscha</i>	E	OR, WA
	Chum Salmon (Columbia R. [Year-Round], Olympic Peninsula Rivers [Summer], Hood Canal [Summer], and Dungeness Bay [Summer])	<i>Oncorhynchus keta</i>	T	OR, WA
	Coastal Cutthroat Trout (Columbia R. and Tributaries, Lower	<i>Oncorhynchus clarki clarki</i>	PT	OR, WA

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SPECIES TYPE	COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ¹	STATE IN WHICH LISTED
	Willamette R., and Coastal Drainages between Columbia River and Grays Harbor)			
	Clover Valley Speckled Dace	<i>Rhinichthys osculus oligoporus</i>	E	NV
	Coho Salmon (OR Coastal Areas)	<i>Oncorhynchus kisutch</i>	PT	OR
	Coho Salmon (OR SW River Basins)	<i>Oncorhynchus kisutch</i>	T	OR
	Desert Dace	<i>Eremichthys acros</i>	T	NV
	Foskett Speckled Dace	<i>Rhinichthys osculus ssp.</i>	T	OR
	Hutton Tui Chub	<i>Gila bicolor ssp.</i>	T	OR
	Independence Valley Speckled Dace	<i>Rhinichthys osculus lethoporus</i>	E	NV
	Kendall Warm Springs Dace	<i>Rhinichthys osculus thermalis</i>	E	WY
	Lahontan Cutthroat Trout	<i>Oncorhynchus clarki henshawi</i>	T	OR, NV, UT
	Lost River Sucker	<i>Deltistes luxatus</i>	E	OR
	Oregon Chub	<i>Oreonichthys crameri</i>	E	OR
	Pallid Sturgeon	<i>Scaphirhynchus albus</i>	E	MT
	Shortnose Sucker	<i>Chasmistes brevirostris</i>	E	OR
	Sockeye Salmon (Snake R. and Wherever Found in ID)	<i>Oncorhynchus nerka</i>	E	ID, OR, WA
	Sockeye Salmon (Ozette Lake and Tributary Streams)	<i>Onchorynchus nerka</i>	T	WA
	Steelhead Trout (Lower and Middle Columbia R., Hood R., Upper Willamette R., and Lower Willamette R. [Winter Only])	<i>Oncorhynchus mykiss</i>	T	OR, WA
	Steelhead Trout (Snake River Basin)	<i>Oncorhynchus mykiss</i>	T	ID, OR, WA
	Steelhead Trout (Upper Columbia River)	<i>Oncorhynchus mykiss</i>	E	WA, OR
	Steelhead Trout (Coastal River Basins South of Elk R. in Curry County, OR)	<i>Oncorhynchus mykiss</i>	PT	OR
	Warner Sucker	<i>Catostomus warnerensis</i>	T	OR
	White Sturgeon (Kootenai R.)	<i>Acipenser transmontanus</i>	E	ID, MT
MAMMALS	Canada Lynx	<i>Lynx canadensis</i>	T	ID, MT, OR, UT, WA, WY
	Columbian White-tailed Deer	<i>Odocoileus virginianus leucurus</i>	E	OR, WA
	Gray Wolf	<i>Canis lupus</i>	E	ID, MT, WA
	Gray Wolf	<i>Canis lupus</i>	EXPN	WY, ID, MT
	Gray Wolf	<i>Canis lupus</i>	PT	ID, MT, OR, UT, WA, WY
	Grizzly Bear	<i>Urus arctos horribilis</i>	T	MT, WA, ID, WY
	Grizzly Bear	<i>Urus arctos horribilis</i>	EXPN	ID, MT
	Northern Idaho Ground Squirrel	<i>Spermophilus burnneus brunneus</i>	T	ID
	Preble's Meadow Jumping Mouse	<i>Zapus hudsonius preblei</i>	T	WY
	Woodland Caribou	<i>Rangifer tarandus caribou</i>	E	WA, ID
PLANTS	Applegate's Milk-vetch	<i>Astragalus applegatei</i>	E	OR
	Bradshaw's Desert Parsley (Lomatium)	<i>Lomatium bradshawii</i>	E	OR, WA
	Colorado Butterfly Plant	<i>Gaura neomexicana coloradensis</i>	T	WY
	Cook's Lomatium	<i>Lomatium cookii</i>	PE	OR
	Desert Milk-vetch	<i>Astragalus desereticus</i>	T	UT
	Desert Yellowhead	<i>Yermo xanthocephalus</i>	PT	WY
	Gentner's Fritillary	<i>Fritillaria gentneri</i>	E	OR
	Golden paintbrush	<i>Castilleja levisecta</i>	T	OR, WA
	Holmgren Milk-vetch	<i>Astragalus homgreniorum</i>	PE	UT
	Howell's Spectacular Thelypody	<i>Thelypodium howellii spectabilis</i>	T	OR
	Kincaid's Lupine	<i>Lupinus sulphureus kincaidii</i>	T	OR, WA
	Large-flowered Woolly Meadowfoam	<i>Limnanthes floccosa grandiflora</i>	PE	OR
	MacFarlane's Four-O'Clock	<i>Mirabilis macfarlanei</i>	T	OR, ID
	Malheur Wire-lettuce	<i>Stephanomeria malheurensis</i>	E	OR
	Marsh Sandwort	<i>Arenaria paludicola</i>	E	OR, WA
	Nelson's Checker-mallow	<i>Sidalcea nelsoniana</i>	T	OR, WA

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SPECIES TYPE	COMMON NAME	SCIENTIFIC NAME	FEDERAL STATUS ¹	STATE IN WHICH LISTED
	Rough Popcornflower	<i>Plagiobothrys hirtus</i>	E	OR
	Shivwitz Milk-vetch	<i>Astragalus ampullarioides</i>	PE	UT
	Showy Stickseed	<i>Hackelia venusta</i>	PE	WA
	Ute ladies'-tresses	<i>Spiranthes diluvialis</i>	T	ID, MT, UT, WA, WY
	Water Howellia	<i>Howellia aquatilis</i>	T	MT, OR, WA, ID
	Wenatchee Checker-mallow	<i>Sidalcea oregona calva</i>	E	WA
	Western Lily	<i>Lilium occidentale</i>	E	OR
	Willamette Daisy	<i>Erigeron decumbens decumbens</i>	E	OR
	Winkler Cactus	<i>Pediocactus winkleri</i>	T	UT
AQUATIC INVERTEBRATES	Banbury Springs Limpet	<i>Lanx sp.</i>	E	ID
	Bliss Rapids Snail	<i>Taylorconcha serpenticola</i>	T	ID
	Bruneau Hot Springsnail	<i>Pyrgulopsis bruneauensis</i>	E	ID
	Idaho Springsnail	<i>Fontelicella idahoensis</i>	E	ID
	Snake River Physa Snail	<i>Physa natricina</i>	E	ID
	Utah Valvata Snail	<i>Valvata utahensis</i>	E	ID, UT
	Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	T	OR
¹ Status Definitions: E = Endangered EXPN = Experimental Population, Non-Essential PE = Proposed Endangered PT = Proposed Threatened T = Threatened				

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Table B: Legal Documentation Supporting the Federal Listing of Threatened and Endangered Species in the BPA Service Area (as of April 2001).

COMMON NAME	DATE FIRST LISTED	FEDERAL REGISTER REFERENCE (Most Recent)	LEAD USFWS REGION	CRITICAL HABITAT	SPECIAL RULES
FISH					
Borax Lake Chub	28-May-80	47 FR 43964	1	50 CFR 17.95(e)	None
Bull Trout	10-Jun-98	64 FR 58909	1	None	50 CFR 17.44(w) and 50 CFR 17.44(x)
Chinook Salmon (Snake R., Tucannon R., Grande Ronde R., Imnaha R., Salmon R., and Clearwater R. [All Fall Only])	22-Apr-92	64 FR 14077	NMFS	50 CFR 226.205	None
Chinook Salmon (Snake R., Tucannon R., Grande Ronde R., Imnaha R., and Salmon R. [All Spring/Summer])	22-Apr-92	58 FR 49880	NMFS	50 CFR 226.205	None
Chinook Salmon (Puget Sound, Upper Columbia R., Upper White Salmon R., Upper Clackamas R. [Fall/Summer], and Upper Willamette R.)	2-Aug-99	64 FR 41839	NMFS	50 CFR 226.212	50 CFR 223.203
Chinook Salmon (Lower Columbia R.)	2-Aug-99	64 FR 41839	NMFS	50 CFR 226.212	None
Chum Salmon (Columbia R. [Year-Round], Olympic Peninsula Rivers [Summer], Hood Canal [Summer], and Dungeness Bay [Summer])	2-Aug-99	64 FR 41839	NMFS	50 CFR 226.212	50 CFR 223.203
Clover Valley Speckled Dace	10-Oct-89	54 FR 41453	1	None	None
Coho Salmon (OR SW River Basins)	18-Jun-97	64 FR 33039	NMFS	None	None
Desert Dace	11-Mar-67	50 FR 50309	1	50 CFR 17.95(e)	50 CFR 17.44(m)
Foskett Speckled Dace	28-Mar-85	50 FR 12305	1	None	50 CFR 17.44(j)
Hutton Tui Chub	28-Mar-85	50 FR 12305	1	None	50 CFR 17.44(j)
Independence Valley Speckled Dace	10-Oct-89	54 FR 41453	1	None	None
Kendall Warm Springs Dace	13-Oct-70	35 FR 16048	6	None	None
Lahontan Cutthroat Trout	13-Oct-70	40 FR 29864	1	None	50 CFR 17.44(a)
Lost River Sucker	18-Jul-88	53 FR 27134	1	None	None
Oregon Chub	18-Oct-93	58 FR 53804	1	None	None
Pallid Sturgeon	6-Sep-90	55 FR 36647	6	None	None
Shortnose Sucker	18-Jul-88	53 FR 27134	1	None	None
Sockeye Salmon (Snake R. and ID)	3-Jan-92	57 FR 212 213	NMFS	50 CFR 226.205	None
Sockeye Salmon (Ozette Lake and Tributary Streams)	25-Mar-99	64 FR 41839	NMFS	50 CFR 226.212	50 CFR 223.203
Steelhead Trout (Lower	17-Jun-98	63 FR 32998	NMFS	50 CFR 226.212	50 CFR 223.203

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COMMON NAME	DATE FIRST LISTED	FEDERAL REGISTER REFERENCE (Most Recent)	LEAD USFWS REGION	CRITICAL HABITAT	SPECIAL RULES
and Middle Columbia R., Hood R., Upper Willamette R., and Lower Willamette R. [Winter Only]					
Steelhead Trout (Snake River Basin)	17-Jun-98	63 FR 32998	NMFS	50 CFR 226.212	50 CFR 223.203
Steelhead Trout (Upper Columbia River)	17-Jun-98	63 FR 32998	NMFS	50 CFR 226.212	None
Warner Sucker	27-Sep-85	50 FR 39123	1	50 CFR 17.95(e)	50 CFR 17.44(i)
White Sturgeon (Kootenai R.)	6-Sep-94	59 FR 46002	1	None	None
BIRDS					
Bald Eagle	12-Jul-95	60 FR 36010	3	None	50 CFR 17.41(a)
Brown Pelican	2-Jun-70	35 FR 16048	1	None	None
Marbled Murrelet	1-Oct-92	57 FR 45337	1	50 CFR 17.95(b)	None
Northern Spotted Owl	26-Jun-90	55 FR 26194	1	50 CFR 17.95(b)	None
Piping Plover	11-Dec-85	50 FR 50734	3	None	None
Short-tailed Albatross	2-Jun-70	65 FR 46654	7	None	None
Western Snowy Plover	5-Mar-93	58 FR 12874	1	50 CFR 17.95(b)	None
Whooping Crane	11-Mar-67	35 FR 8498	2	50 CFR 17.95(b)	None
INSECTS					
Oregon Silverspot Butterfly	2-Jul-80	45 FR 44939	1	50 CFR 17.95(i)	None
Fender's Blue Butterfly	25-Jan-00	65 FR 3890	1	None	None
MAMMALS					
Canada Lynx	24-Mar-00	65 FR 16086	6	None	50 CFR 17.40(k)
Columbian White-tailed Deer	11-Mar-67	32 FR 4001	1	None	None
Gray Wolf	11-Mar-67	41 FR 24067	3	50 CFR 17.95(a)	None
Grizzly Bear	11-Mar-67	40 FR 31736	6	None	50 CFR 17.40(b)
Northern Idaho Ground Squirrel	5-Apr-00	65 FR 17786	1	None	None
Preble's Meadow Jumping Mouse	13-May-98	63 FR 26530	6	None	None
Woodland Caribou	14-Jan-83	48 FR 49249	1	None	None
SNAILS					
Banbury Springs Limpet	14-Dec-92	57 FR 59257	1	None	None
Bliss Rapids Snail	14-Dec-92	57 FR 59257	1	None	None
Bruneau Hot Springsnail	25-Jan-93	58 FR 5946	1	None	None
Idaho Springsnail	14-Dec-92	57 FR 59257	1	None	None
Snake River Physa Snail	14-Dec-92	57 FR 59257	1	None	None
Utah Valvata Snail	14-Dec-92	57 FR 59257	1	None	None
Vernal Pool Fairy Shrimp	19-Sep-94	59 FR 48153	1	None	None
PLANTS					
Applegate's Milk-vetch	28-Jul-93	58 FR 40551	1	None	None
Bradshaw's Desert Parsley (Lomatium)	30-Sep-88	53 FR 38451	1	None	None
Colorado Butterfly Plant	18-Oct-00	65 FR 62310	6	None	None
Desert Milk-vetch	20-Oct-99	64 FR 56596	6	None	None
Gentner's Fritillary	10-Dec-99	64 FR 69203	1	None	None
Golden Paintbrush	11-Jun-97	62 FR 31748	1	None	None
Howell's Spectacular Thelypody	26-May-99	64 FR 28403	1	None	None
Kincaid's Lupine	25-Jan-00	64 FR 3890	1	None	None
MacFarlane's Four-O'Clock	26-Oct-79	61 FR 10697	1	None	None
Malheur Wire-lettuce	10-Nov-82	47 FR 50885	1	50 CFR 17.96(a)	None
Marsh Sandwort	3-Aug-93	58 FR 41384	1	None	None
Nelson's Checker-	12-Feb-93	58 FR 8243	1	None	None

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COMMON NAME	DATE FIRST LISTED	FEDERAL REGISTER REFERENCE (Most Recent)	LEAD USFWS REGION	CRITICAL HABITAT	SPECIAL RULES
mallow					
Ute Ladies' Tresses	17-Jan-92	57 FR 2053	6	None	None
Rough Popcornflower	25-Jan-00	65 FR 3875	1	None	None
Ute Ladie's-tresses	17-Jan-92	57 FR 205	6	None	None
Water Howellia	14-Jul-94	59 FR 35864	6	None	None
Wenatchee Checker-mallow	22-Dec-99	64 FR 71687	1	None	None
Western Lily	17-Aug-94	59 FR 42176	1	None	None
Willamette Daisy	25-Jan-00	65 FR 3890	1	None	None
Winkler Cactus	20-Aug-98	63 FR 44595	6	None	None

Appendix D

MAJOR PUBLIC COMMENT ISSUES/NORTHWEST POWER PLANNING COUNCIL FRAMEWORK CONCEPT PAPERS

A. Major Public Comment Issues

The key questions listed below were identified from a three-day conference held in November 1998.

DRAFT 3/1/99

QUESTIONS FROM THE 3 DAY NOVEMBER CONFERENCE
*CREATING AND PRESERVING A HEALTHY, RESILIENT AND SUSTAINABLE
SOCIAL AND ECOLOGICAL SYSTEM*

KEY QUESTIONS (More Than 5 Votes)

1. **(77)** Will politics continue status quo because of
 - a. conflicting legal mandates (e.g., ESA, CWA, NWPA)?
 - b. a mismatch between political and ecological boundaries?
 - c. Corporate interests?
 - d. environmental groups strong campaign for their interests?
 - e. the lack of regional and/or national political will to resolve the problem?
2. **(35)** Will there be a proliferation of process by the sheer number of decision makers and stakeholders?
3. **(90)** Will the increasing population lead to:
 - a. an urban and rural split?
 - b. reliance on mining and natural resources for economic development?
 - c. an increase in per capita consumption?
 - d. an unwillingness to examine/model futures analyses?
4. **(10)** Will there be a change in values:
 - a. that creates an unavailability of funding?
 - b. that constantly causes changes in economies and values?
 - c. that end in greed
5. **(11)** Is there a lack of trust:
 - a. with the government agencies?
 - b. among stakeholders?
 - c. others?
6. **(34)** Are we:
 - a. pitting species and resources against each other (using mitigation of one to “justify” loss of another)?
 - b. causing conversions of habitat we can’t get back?
7. **(50)** Are we failing to manage ourselves:

- a. by not focusing on species and systems?
 - b. because it is cheaper/easier to avoid responsibility than to take responsibility?
 - c. by transferring costs of one resource to another (e.g., not internalizing costs)?
 - d. by following private agendas (i.e., tragedy of common good)?
 - e. by the lack of developing a stewardship paradigm?
8. **(11)** Are there incompatible goals for river use?
9. **(16)** Is there an inability to deal with uncertainty (analysis paralysis) because:
- a. there is an inability to move from crisis management to planning?
 - b. every interest group has ability to veto a plan?
 - c. there is an inability to change?
 - d. the cynicism is inhibiting the development of solutions?
 - e. there is an unwillingness to act in face of imperfect information?
10. **(23)** Is there something to learn from historical mistakes?
11. **(28)** Will an engineering solution work for the biological/environmental problems (techno-fix)?
12. **(87)** Is there a lack of an ecosystem approach to species recovery because of:
- a. a lack of understanding of the natural spawning process?
 - b. a lack of a total system focus?
 - c. an increasing awareness of natural/normative solutions?
 - d. a lack of understanding the importance location of headwaters to the system makes?
 - e. an increasing recognition of place (i.e. local involvement)?
 - f. a violation of basic ecological principles?
 - g. conversion of irreplaceable habitat?
13. **(47)** Is the Government living up to promises of sovereignty:
- a. involving public v. sovereign concerns?
 - b. by understanding Indian Treaty rights?

B. Summary of Framework Concept Papers

The following is a summary of the 28 concept papers prepared by the Framework Workgroup. These concept papers were submitted to the Framework for consideration as possibilities as multi-species plans for fish and wildlife recovery in the Columbia River Basin.

Northwest Power Planning Council FRAMEWORK CONCEPT PAPERS

November 1998

No. Concept Paper

1. Save Our Wild Salmon Coalition

GOAL

Abundant, harvestable, self-sustaining, wild, native fishes.

OBJECTIVES

- Protect and restore habitat;
- Improve artificial production;
- Improve harvest management by protecting wild stocks and targeting strong stocks; and
- Reduce dam mortality by moving toward normative river conditions and providing safe passage at all projects.

STRATEGIES

- Habitat: Manage lands to protect f/w habitat; reduce commodity subsidies, protect and restore wetlands, estuaries & riparian areas; provide stream flows, provide water from upper Snake pending dam removal; conserve water; screen diversions; sustainable farming; end water waste; comply with Clean Water Act; control non-native predators.
- Hatcheries: plant fish consistent with watershed carrying capacity avoid harm to wild fish; don't use in lieu of habitat; reduce spending in favor of habitat spending.
- Harvest: allow escapement and renegotiate international treaties.
- Dams: no new dams, end transport, take out lower Snake dams, lower JDA to spillway; move to normative conditions elsewhere; remove unmitigable dams (Condit, Enloe); meet agency and tribal flow targets, spill, pay the true cost of hydropower.

MANAGEMENT ACTIONS

None identified

2. Idaho Rivers United, Idaho Steelhead and Salmon United, and Trout Unlimited

GOAL

Attain naturally sustainable f/w to support harvest by restoring biological integrity and diversity; delist ESA stocks; maintain affordable energy and strong BPA for regional prosperity.

OBJECTIVES

- Snake stocks at harvestable levels via 2-6% smolt-adult returns, and improved egg-smolt survival;
- Rebuild Snake ChF in Blue Mtn. Tributaries via 2-6% smolt-adult returns;
- Recover Snake sockeye via 1.5-2% smolt-adult returns to Redfish;
- Rebuild mid-Col ChSp/Su, sockeye and StSu by improved smolt survival with flow aug. and normalized hydrograph;

- Enhance mid-Col. ChF by preserving Hanford and normalized hydrograph below Priest;
- Secure ICBMP category 1 subbasins and reconnect category 2 subbasins, implement IRCs and VARQ flood control strategies at Hungry Horse and Libby; and
- Ensure cost-effective investments.

STRATEGIES

- Breach lower Snake dams by 2005 (objectives 1-3);
- Restore normative flows from Priest to estuary via flow augmentation (objectives 4-6);
- Use BPA money for projects with the best likelihood of success, and maintain or reduce direct outlays as stocks recover;
- Commit to affordable steps to retain access to low-cost energy.

MANAGEMENT ACTIONS

Snake:

- end transportation;
- breach the lower dams;
- eliminate flow augmentation;
- normalize Hells Canyon flows;
- implement IRCs at Dworshak;
- phase out hatcheries and supplementation as stocks recover.

Upper Columbia:

- use Canadian storage to augment flows;
- 24-hour spill in the Spring from Priest down;
- IRCs at all storage projects shift peaking to upper Columbia projects;
- shape flood control releases to help resident and anadromous fish.

Lower Columbia:

- operate JDA at MIP pending JDA draw-down studies through 2006; other projects at MOP;
- install gas abatement, ladder improvements, etc.;
- evaluate extended screens, surface collectors, etc. at TDA;
- stop spending on Bonneville outfall.
- Use tiered flow for Kootenai white sturgeon, and IRCs and VAPQ.
- coordinate planning and implementation system-wide

3. Columbia River Inter-Tribe Fish Commission

GOAL

Restore anadromous fish to support tribes' cultural and commercial practices emphasizing natural production and healthy rivers; protect tribes, sovereignty and treaty rights

OBJECTIVES

- Within 7 years, halt declines in salmon, sturgeon, and lamprey above Bonneville;
- Within 25 years, increase salmon returns to 4 million naturally-produced fish above Bonneville and sturgeon and lamprey to harvestable levels;
- Restore salmon to historic abundance in perpetuity.

STRATEGIES

- Improve streams by controlling land use;
- Improve flows by limiting diversions and using water efficiently;
- Restore watersheds for threatened stocks;
- Use supplementation for most threatened fish and re-introductions; use flow, spill, drawdowns, efficient turbines and operations and predator control;
- Restore critical estuary habitat;
- Ret Alaska and Canadian harvest by abundance;

- Use cold stored water and more and better ladders for adults
- Reduce water contaminants
- Monitor tributary production and escapement to improve harvest management
- Research lamprey and develop supplementation programs
- Artificial production for white sturgeon above Bonneville.

MANAGEMENT ACTIONS

Habitat:

- land and water users meet habitat conditions required to achieve survival rates
- use coarse-screening process to determine allowable watershed impacts

Production:

- use supplementation to avoid extirpations

Passage:

- end transportation
- return mainstem habitat to natural conditions for 71% survival by drawdowns, flows, spill, breaching lower Snake dams and lowering JDA to spillway.

4. Shoshone-Bannock Tribes

GOAL

Maintain & restore ecosystem for all naturally producing indigenous species and provide for cultural/spiritual needs.

OBJECTIVES

- Restore the natural hydrograph and lessen ecosystem impacts generally;
- Continue existing habitat protections
- Enforce existing treaties and f/w laws;
- Review existing laws that hurt habitat
- Restore damaged habitat;
- Increase production of indigenous f/w
- Secure harvest opportunities.

STRATEGIES

None identified

MANAGEMENT ACTIONS

None identified

5. Trout Unlimited

GOAL

Protect and restore ecological values of the Basin, create a network of complex, interconnected, high quality habitats that support sustainable and harvestable wild fish while mitigating impacts on the region.

OBJECTIVES

Habitat:

- protect existing habitat;
- restore degraded habitat; and
- enforce existing land use regulations.

Hydropower:

- no new development;
- make existing facilities fish-friendly;
- restore normative conditions by breaching lower Snake dams and lowering JDA to spillway;

- use spill, flow augmentation, better bypass and gas abatement.

Hatcheries:

- use to restore wild salmonids;
- reduce use of hatcheries to replace degraded habitat.

Harvest:

- reduce ocean and river harvest and manage for conservation;
- develop selective fisheries;
- resolve US-Canada allocation and equity issues.

Mitigation:

- maintain cost-based power, low-cost transportation for agricultural products, and irrigation pumping from mainstem reservoirs.

STRATEGIES

- **Habitat:** protect habitat for viable populations, breach lower Snake dams and lower JDA to spillway, federal agencies manage land to restore degraded habitat including finalization of standards based on ICBMP science; enforce ESA “take” provisions on private land; implement Clean Water Act TMDLs and state ambient water quality standards and waterway uses; enforce state water laws on waste quantity.
- **Hydropower:** all dams provide suitable flows passage and consistency with watershed efforts; restore normative conditions, reduce reliance on transportation and upstream storage; pending draw-downs, use transportation only in low-flow years; identify and address problems at non-hydropower dams.
- **Hatcheries:** gather more information on natural production; use only if no impact to wild salmonids, mimic natural conditions in broodstock collection, rearing, feeding, acclimation and release; treat artificial production experimentally, complete review of Mitchell Act and LSCR, PUD and other facilities.
- **Harvest:** allow harvest only where impacts to wild fish are quantified and minimized; adopt abundance-based regime in US-Canada to protect weak stocks; reduce harvest of chinook to 50% total mortality throughout their range; continue to develop selective fisheries.
- **Mitigation:** show those who would privatize PMAs that BPA is carrying out vital energy conservation and f/w programs; support development of alternative forms of transportation; and lower irrigation pumps while paying higher electric costs of pumping.

MANAGEMENT ACTIONS

None identified

6. C. Petrosky, H. Schaller, P. Wilson, E. Weber, and O. Langness

GOAL

Sustainable, naturally-producing f/w to support tribal and non-tribal harvest, cultural and economic practices by restoring biological integrity and genetic diversity of ecosystem and through other ways compatible with naturally-producing f/w.

OBJECTIVES

- Reduce cumulative mortality to encourage wider distribution and more life history types within metapopulation concept;
- For upper-basin anadromous fish, significantly reduce passage mortality by returning to more normative conditions;
- Recover, de-list and restore ESA fish to harvestable levels;
- Rebuild depleted non-ESA fish and protect healthy natural populations to support harvest while maintaining wide distribution
- Rebuild depleted lamprey to support cultural use and restore ecosystem function;
- Restore anadromous fish ecosystem functions to benefit native resident fish and wildlife by increasing prey base and nutrient recycling and restoring more normative conditions.

STRATEGIES

- Implement actions with best chance of success,
- Generate information to reduce uncertainties,
- Use an experimental management approach that prioritizes conservation and recovery of weak populations while compatible with other f/w, and
- Emphasize actions that benefit wide range of species:
- Listed fish:
 - Snake: promptly implement hydropower actions under 1999 ESA decision and evaluate effects between regions
 - Upper Columbia: implement hydropower actions under ESA and study feasibility of JDA draw down, evaluate effects of hydropower actions between regions
 - Lower Columbia: take other actions and evaluate stocks for between-region comparison.
- Unlisted anadromous fish: evaluate stocks for between-region comparison.
- Other anadromous fish: evaluate through temporal and spatial comparison of population and survival rates.
- Native resident fish and wildlife: evaluate through coordinated, directed studies.

MANAGEMENT ACTIONS

- Coordinate major actions through reverse staircase design, taking actions with measurable responses to illuminate uncertainties, primarily through adult-to-adult and/or smolt-to-adult returns, compared to expected responses for key PATH hypothesis
- Listed fish:
 - Snake: breach four lower dams, evaluate flow augmentation components; reduce and evaluate experimental hatchery releases, later increasing; phase out hydro-mitigation hatcheries as runs increase. Initially, low harvest rates, increasing with recovery. Implement improved land management to restore productivity and connections. Coordinate through experimental management program.
 - Upper Columbia: evaluate feasibility of breaching JDA and implement by 2012; evaluate flow augmentation elements, specify major non-hydropower actions;
 - Lower Columbia: access stocks to develop actions within experimental framework.
- Unlisted anadromous fish: manage harvest to achieve management goals; improve land management, evaluate effects of hatchery release, all coordinated through experimental program.
- Other anadromous fish: benefited by actions for anadromous species.
- Native resident fish and wildlife: restore free-flowing river reaches and riparian habitats to reduce conflicts with anadromous fish flows.

7.a Oregon office of NWPPC (no drawdown, dam retrofit, incremental approach)

GOAL

Sustainable, naturally-producing f/w to support social, cultural and economic practices such as tribal and non-tribal harvest, by restoring biological integrity and genetic diversity of ecosystem and through other ways compatible with naturally-producing f/w. When devising strategies, consider economic and social factors to produce high quality of life and achieve multi-species goals.

OBJECTIVES

- **Primary:** Provide for healthier ecosystem, thereby reducing cumulative impacts on f/w to attain sustainable, diverse, harvestable populations.
- **Specific:**
 - Anadromous salmonids: promote wide array of life histories by restoring depressed populations and maintaining or enhancing healthy stocks and reintroducing and re-establishing stocks across traditional range where feasible.

Non-anadromous salmonids: Rebuild sturgeon and lamprey across historic range, if possible.

Native resident fish: promote wide array of life histories by restoring weak populations to sustainable, harvestable levels and enhancing healthy native stocks, and reintroducing and re-establishing stocks in traditional range where feasible and economically justified.

Non-native resident fish: maintain and enhance in areas where native populations are extirpated or their restoration is infeasible.

Wildlife: manage for native species, protect existing range, expand migratory corridors and link habitats to promote diversity; focus on habitat quality, not quantity. For non-native species, follow non-native resident fish protocol.

Socio-economic:

Cultural: allow salmonids to reach tribal treaty harvest objectives and lamprey and sturgeon to serve cultural needs.

Economic: Maintain shipping from all river ports. Maintain hydropower production to greatest extent possible and restore lost generation through aggressive energy conservation and peak load management. Maintain grazing through use of best management practices with riparian set-asides and fencing in fish-bearing streams and wildlife refuges and temporary mitigation for transition to different land uses.

Forestry: promote sustainable cut with 100-ft riparian set asides for fish-bearing streams and temporary mitigation for transition to best management practices. Irrigation: seek water conservation and efficiencies.

Social/legal: strictly enforce Clean Water Act throughout basin.

STRATEGIES

- **Management intent**: re-establish water velocities equivalent to natural hydrograph, provide spawning and rearing habitat in mainstem and tributaries for anadromous and resident fish. This alternative propose the following strategies by implement incrementally, evaluating results and entailing less cost in the short term.
- **Broad strategy**: Implement in an experimental program that prioritizes recovery of imperiled stocks consistent with maintaining healthy stocks. All strategies must reduce cumulative mortality to a wider range of species and involve hydro and non-hydro actions.
- **Specific strategies**:
 - on an incremental basis, promote aggressive technological fixes at dams (spill, gas abatement);
 - develop surface bypass and other technologies;
 - extended length screens;
 - adult passage improvements;
 - transportation in low flow years;
 - 1.6 maf from upper Snake and 3 maf from Canada through purchase of water rights, current BiOp flow from Brownlee and Dworshak;
 - sliding scale, abundance based harvest, reduce ocean bycatch;
 - current hatchery production;
 - aggressive habitat recovery in mainstem and tributaries with tributary dam breaching where feasible;
 - re-establish floodplains, wetlands, estuaries;
 - water conservation and efficiencies;
 - technological fixes at dams to satisfy Clean Water Act;
 - reservoir rule curves for resident fish;
 - aggressive energy conservation and peak load management;
 - efficient, temporary economic mitigation for affected interests;
 - best management practices for grazing and forestry with large riparian set asides in salmonid streams;
 - reduced power peaking to protect spawning and emergence;
 - passage above Chief Joseph, Grand Coulee and Hells Canyon;
 - terminal fisheries on hatchery fish;

- comprehensive monitoring and evaluation.

MANAGEMENT ACTIONS

None identified.

7.b Oregon office of NWPPC (no drawdown, dam retrofit, reverse staircase)

GOAL

Sustainable, naturally-producing f/w to support social, cultural and economic practices such as tribal and non-tribal harvest, by restoring biological integrity and genetic diversity of ecosystem and through other ways compatible with naturally-producing f/w. When devising strategies, consider economic and social factors to produce high quality of life and achieve multi-species goals.

OBJECTIVES

- **Primary:** Provide for healthier ecosystem, thereby reducing cumulative impacts on f/w to attain sustainable, diverse, harvestable populations.
- **Specific:**
 - Anadromous salmonids: promote wide array of life histories by restoring depressed populations and maintaining or enhancing healthy stocks and reintroducing and re-establishing stocks across traditional range where feasible.
 - Non-anadromous salmonids: Rebuild sturgeon and lamprey across historic range, if possible.
 - Native resident fish: promote wide array of life histories by restoring weak populations to sustainable, harvestable levels and enhancing healthy native stocks, and reintroducing and re-establishing stocks in traditional range where feasible and economically justified.
 - Non-native resident fish: maintain and enhance in areas where native populations are extirpated or their restoration is infeasible.
 - Wildlife: manage for native species, protect existing range, expand migratory corridors and link habitats to promote diversity; focus on habitat quality, not quantity. For non-native species, follow non-native resident fish protocol.
 - Socio-economic:
 - Cultural:* allow salmonids to reach tribal treaty harvest objectives and lamprey and sturgeon to serve cultural needs.
 - Economic:* Maintain shipping from all river ports. Maintain hydropower production to greatest extent possible and restore lost generation through aggressive energy conservation and peak load management. Maintain grazing through use of best management practices with riparian set-asides and fencing in fish-bearing streams and wildlife refuges and temporary mitigation for transition to different land uses.
 - Forestry:* promote sustainable cut with 100-ft riparian set asides for fish-bearing streams and temporary mitigation for transition to best management practices.
 - Irrigation:* seek water conservation and efficiencies.
 - Social/legal:* strictly enforce Clean Water Act throughout basin.

STRATEGIES

- As above, except that all strategies are implement at once, with large up-front costs and less biological risk. Potential to avoid the expense of some strategies based on biological response.

MANAGEMENT ACTIONS

None identified.

7.c Oregon office of NWPPC (no transport/drawdown incremental approach)

GOAL

Sustainable, naturally-producing f/w to support social, cultural and economic practices such as tribal and non-tribal harvest, by restoring biological integrity and genetic diversity of ecosystem and through other ways compatible with naturally-producing f/w. When devising strategies,

consider economic and social factors to produce high quality of life and achieve multi-species goals

OBJECTIVES

- Same fish and wildlife objectives.
- **Socio-economic objectives:**
 - Cultural:* allow salmonids to reach tribal treaty harvest objectives and lamprey and sturgeon to serve cultural needs.
 - Economic:* Maintain shipping from Lewiston by moving to rail transportation; maintain barge transportation through lower John Day pool by using shallow draft vessels to Try Cities. Replace lost hydropower generation. Same objectives for grazing, forestry and irrigation.
 - Social/legal objectives:* Pass legislative to draw down four lower Snake dams and John Day, strictly enforce Clean Water Act throughout basin.

STRATEGIES

- Same “management intent” and “broad strategy.”
- **Specific strategies:** As above, but incremental drawdown of two dams followed by evaluation and further drawdowns if justified by monitoring results. Drawdown is first strategy implemented. If response is less than anticipated, add restrictions incrementally, monitor response and add further increments if needed. Replace lost hydropower generation through least-cost mix of power purchases, aggressive energy conservation, development of cost-effective renewables, and high efficiency thermal generation. Mitigate incremental production of carbon dioxide through offsets.

MANAGEMENT ACTIONS

None identified.

7.d Oregon office of NWPPC (no transport/drawdown reverse staircase)

GOAL

Sustainable, naturally-producing f/w to support social, cultural and economic practices such as tribal and non-tribal harvest, by restoring biological integrity and genetic diversity of ecosystem and through other ways compatible with naturally-producing f/w. When devising strategies, consider economic and social factors to produce high quality of life and achieve multi-species goals.

OBJECTIVES

- **Primary:** Provide for healthier ecosystem, thereby reducing cumulative impacts on f/w to attain sustainable, diverse, harvestable populations.
- **Specific:**
 - Anadromous salmonids:** promote wide array of life histories by restoring depressed populations and maintaining or enhancing healthy stocks and reintroducing and re-establishing stocks across traditional range where feasible. **Non-anadromous salmonids:** Rebuild sturgeon and lamprey across historic range, if possible.
 - Native resident fish:** promote wide array of life histories by restoring weak populations to sustainable, harvestable levels and enhancing healthy native stocks, and reintroducing and re-establishing stocks in traditional range where feasible and economically justified.
 - Non-native resident fish:** maintain and enhance in areas where native populations are extirpated or their restoration is infeasible.
 - Wildlife:** manage for native species, protect existing range, expand migratory corridors and link habitats to promote diversity; focus on habitat quality, not quantity. For non-native species, follow non-native resident fish protocol.
 - Socio-economic:**
 - Cultural:* allow salmonids to reach tribal treaty harvest objectives and lamprey and sturgeon to serve cultural needs.

Economic: Maintain shipping from all river ports. Maintain hydropower production to greatest extent possible and restore lost generation through aggressive energy conservation and peak load management. Maintain grazing through use of best management practices with riparian set-asides and fencing in fish-bearing streams and wildlife refuges and temporary mitigation for transition to different land uses.

Forestry: promote sustainable cut with 100-ft riparian set asides for fish-bearing streams and temporary mitigation for transition to best management practices.

Irrigation: seek water conservation and efficiencies.

Social/legal: strictly enforce Clean Water Act throughout basin.

STRATEGIES

Same, but implementing all strategies at once, and drawing down four lower Snake dams to natural river and John Day to spillway crest. Potential to avoid the expense of some strategies based on biological response.

MANAGEMENT ACTIONS

None identified.

8. Montana Dept. of Fish, Wildlife & Parks

GOAL

Restore normative flow conditions in mainstem and headwaters; follow ecologically and economically sustainable operating strategy; restore naturally producing f/w throughout basin by restoring and reconnecting habitats.

OBJECTIVES

- Implement dam operations that reduce storage drafts, improve refill probability and create more natural hydrograph downstream;
- Coordinate operations to extend runoff events for anadromous fish while protecting headwater species;
- Key operations to monthly inflow forecasts and tier springflow releases based on water availability at each project;
- Modify flood control operations to allow variable releases to simulate spring freshet;
- Gradually draft reservoirs to avoid flow fluctuations, reduce width or varial zones and enhance productivity

STRATEGIES

- Implement current IRCs and develop them for other projects, following specified protocol.
- Implement tiered flows for Kootenai white sturgeon below Libby.
- Implement VARQ flood control strategy to approximate spring freshet improve velocities in the Snake, JDA and MCN reservoirs by implementing results of PATH analyses, transfer peaking operations to headwater facilities

MANAGEMENT ACTIONS

- Complete IRCs for projects that lack them (via specific steps);
- Implement IRCs using tiered flows and VARQ strategy;
- Reduce reservoir drafts and improve refill to assure sustainable operations for all species;
- Replace static flow targets in lower Columbia with attainable, normative-type flow targets resulting from basin-wide application of IRCs;
- Coordinate mitigation with system operating plan;
- Reclaim habitat;
- Restore temperature regimes through selective withdrawal at storage projects and correlate flow and temperature with riverine fish growth and migrations for native species;
- Reduce watershed impacts through fencing and other passive measures and Rosgen techniques to restore original channel types;

- Establish alternative fishing opportunities; and
- Establish genetic reserves of important native stocks.

9. Idaho Department of Fish and Game

GOAL

None identified.

OBJECTIVES

- Be risk averse and robust across a range of scientific hypotheses and assumptions;
- Provide high likelihood of recovery within 24 years for Snake ChSp/Su with a 2-6% smolt-adult survival for inriver fish (perhaps 3-7% for steelhead);
- Provide a high likelihood of recovery within 24 years for Snake ChF by restoring more normative incubation, rearing and migration water temperatures, velocities, turbidity and micro-habitats; and reconnecting fragmented habitats;
- Preserve or enhance native stock structures and genetic diversity

STRATEGIES

None identified.

MANAGEMENT ACTIONS

- Focus on primary ecological factors limiting recovery, including divergent productivity of upriver and lower riverstocks
- Recreate key ecological functions rather than circumvent them;
- Focus on wild native fish, using artificial production where ecologically prudent
- Focus on listed anadromous fish while optimizing benefits for resident fish and wildlife.

10. Native Fish Society

GOAL

Protect and rebuild abundance and distribution of locally adapted, native wild salmonids, maintain genetic and life history diversity and ecological benefits.

OBJECTIVES

None identified.

STRATEGIES

- Define units of management action at population and watershed level;
- Inventory biological diversity to establish benchmarks for genetic and life history structure;
- Adopt biological objectives that maintain biological diversity;
- Develop science-based management plans that maintain biological diversity;
- Conduct scientific audit of results, research needs, policy and management issues;
- Involve the public in finding solutions.

MANAGEMENT ACTIONS

- Establish reference watersheds and populations as controls for a range of species and ecological conditions;
- Implement existing laws and regulations for fish, wildlife and habitat protection;
- Determine genetic and life history diversity as benchmarks;
- Establish sediment threshold for spawning areas that protect egg development and fry emergence;
- Establish temperature thresholds for adults; juveniles and eggs;
- Maintain a population structure that protects weak stocks, genetic and life history diversity;
- Re-establish sources of large woody debris;

- Re-establish ecological linkages in watershed;
- Use RASP to establish rebuilding plans for native salmonids;
- Replace mixed stock fisheries with known stock fisheries;
- Establish escapement objectives for watershed populations;
- Hold harvest managers accountable for meeting objectives;
- Terminate hatcheries that disrupt native fish genetic and life history diversity and have negative ecological effects;
- License hatcheries and review licenses;
- Conduct an annual status review of native stocks;
- Establish a basin policy regarding protection of native fish genetic and life history diversity;
- Independent scientific review of funding proposals in which managers identify assumptions;
- Establish a peer-reviewed journal to document recovery program instead of relying on gray literature;
- Establish a biodiversity institute;
- Develop a science-based information service for decision makers;
- Review hatchery program's impacts on native fish;
- Establish a life cycle-based research and management program for salmonids;
- Stop transferring salmonids among facilities and watersheds;
- Test concept of hatchery that conserves wild populations.

11. Del Lathim

GOAL

Make downriver passage as safe as a natural river, increasing hydro generation 25%

OBJECTIVES

- Environmentally friendly passage for anadromous fish;
- Maintain economic benefits of hydro system;
- Protect the ecosystem the dams have created;
- Increase hydro output by 25%;
- Secure tribes' agreement to stop gill netting.

STRATEGIES

- Fish-friendly turbines.

MANAGEMENT ACTIONS

- Fine-tune prototype at Bonneville Unit #4; replace older Kaplan units with friendly turbines; discontinue fish screens; install turbines in skeletal bays and pass water through them instead of spilling.

12. Kokanee Recovery Task Force

GOAL

Stabilize resident fish at 75% of pre-dam levels within 12 years, showing progress in 4 years.

OBJECTIVES

- Meet fish passage efficiency goals;
- Meet water quality standards;
- Increase habitat;
- Increase aquatic population to historic levels;
- Maintain integrity of dams;
- Keep costs commensurate with benefits; and
- Find regional funding from diverse resources.

STRATEGIES

- Determine characteristics of resident fish food sources;
- Determine relationship of target species population dynamics and predators, including level of sustainable harvest;
- Emphasize wild spawning rather than artificial;
- Maximize spawning habitat by manipulating water levels during egg laying, incubation, emergence, and control post-emergence levels to prevent stranding;
- Bring 10 million eggs from other agencies to augment production;
- Use artificial devices to increase fry survival to 80%;
- Reduce gas supersaturation, move fry from Cabinet Gorge hatchery to southern part of lake to avoid gas.

MANAGEMENT ACTIONS

- Pend Oreille at 2055' in winter;
- Cabinet Gorge and Noxon reduce gas to 110% by 2001
- Buy 10 million eggs per year pending recovery;
- Transport fry to southern part of lake when gas exceeds 100%;
- Plant kokanee eggs in incubation protection systems in southern part of lake until gas problem is addressed.

13. Upper Columbia River Co-Management Entities

GOAL

A healthy Columbia River ecosystem that supports viable and genetically diverse fish with harvest and other societal benefits.

OBJECTIVES

- A stable, locally adapted Upper Columbia ecosystem that produces natural resident fish at pre-dam levels; and/or
- Reintroduce and build anadromous fish above blockages to historic levels.

STRATEGIES

- A comprehensive mitigation program of native resident fish restoration and non-native fish substitution as in Council program and MYIP; and/or
- Develop fish passage at Chief Joseph and Grand Coulee, concurrently re-introducing anadromous fish that genetically and behaviorally resemble former populations above those projects.

MANAGEMENT ACTIONS

None identified

14. Jim Litchfield

GOAL

Naturally spawning, sustainable and diverse f/w, balancing preservation of economic infrastructure including multipurpose river use.

OBJECTIVES

- Enhance core while protecting listed populations;
- Take actions with most biological benefit and least cost first;
- Through watershed audit, identify biological priorities for prime watersheds, production watersheds and watersheds unsuitable for fish;
- Establish population goals and harvest limits;
- Enhance production for harvest with no harm to natural production;

- Change dam configuration only where critical survival bottlenecks can't be addressed otherwise and costs are justified by probable biological benefits;
- Value over- more than under-escapement in harvest mgt;
- Manage flood events to facilitate scouring;
- Use watersheds as fundamental mtg. Unit;
- Regional council adopt top-down priorities, watersheds heavily involved in deciding how to implement them in balance with local priorities and;
- Modify laws accordingly, where needed;

STRATEGIES

- Scope is entire basin;
- Develop unified plan that classifies biological objectives developed by regional council;
- Incorporates a high degree of local control;
- Covers the whole life cycle, including the ocean and estuary; and
- Because dam effects are uncertain, conducts a fish mortality audit for adults and juveniles, to guide changes in dam configuration (correct highest mortalities first, especially adult mortality).

MANAGEMENT ACTIONS

None specifically identified

15. Sun Mountain Reflections

GOAL

Redesign hydro projects to mimic natural aquatic structure, improve water quality, restore habitat, restore harvestable populations and maintain integrity of dams.

OBJECTIVES

- Increase hydro production
- Increase salmon and steelhead
- Improve harvest, habitat and hatchery management
- Maintain existing irrigation and allow more consumptive water use
- Maintain navigation to river ports
- Experiment, gather useful data

STRATEGIES

- Redesign hydro projects to mimic natural bathymetric structure using Wheels, Pools and Falls approach (on the basis of various studies comparing current conditions to historic conditions).
- Develop diverse funding sources including public agencies, tribes, commercial interests and the public.

MANAGEMENT ACTIONS

- Change policies from problem-specific management to resolution of underlying ecological problems that preclude multi-species recovery. View recovery investment as a regional economic benefit rather than a hydropower expense.

16. Rachel Stein

GOAL

Prevent further degradation, then improve environmental condition; ensure resilient social and economic systems

OBJECTIVES

- Establish baseline information;

- Identify human actions that affect ecosystem;
- Create scale to identify ecological tolerance;
- Define activities that can change;
- define surrogate measure for baseline;
- Standardize data and surrogate measurement; and
- Measure change

STRATEGIES

- Use ICBMP to establish baseline
- Use law and other values to establish scale of ecological tolerance
- Work within existing social structures to change human activities
- Define surrogate measures and use them in evaluation.

MANAGEMENT ACTIONS

None identified.

17. Oregon Water Trust

GOAL

Provide instream flows to support naturally functioning small streams

OBJECTIVES

- Restore flows in small tributaries to improve aquatic habitat and improve water quality.

STRATEGIES

- Buy senior water rights and dedicate them to streams.

MANAGEMENT ACTIONS

None identified

18. William K. Watson

GOAL

Salmon restoration

OBJECTIVES

None identified

STRATEGIES

- Improve dam passage;
- Find ways to artificially produce flow at edges of reservoirs; and
- Find ways to artificially clean reservoir gravels.

MANAGEMENT ACTIONS

- At a low dam in the lower river, experiment with new ladders;
- At the shortest reservoir on the river, experiment with ways to artificially produce flow at edges of reservoirs; and
- At the shortest reservoir on the river, find ways to artificially clean reservoir gravels.

19. Phillip R. Mundy

GOAL

Establish comprehensive fisheries management system that protect ecosystem functions, harvest, and other human uses.

OBJECTIVES

- Protect wild salmon and habitat;
- Maintain salmon escapements to protect potential salmon production and maintain ecosystem functions;
- Harvest salmon consistent with uncertainty regarding status of the resource;
- Control human activities that affect salmon;
- Build public support for salmon.

STRATEGIES

- Develop and implement a program of goals and objectives and enact them into law at national, state and local levels;
- Develop and implement tests or criteria to define objectives, measure progress, and adapt program with new information.

MANAGEMENT ACTIONS

- Use framework process and NPPC to develop goals and objectives;
- Enlist a regional forum of federal, state and local law makers to work on implementing legislation;
- Define objectives in terms that can be used in evaluating progress;
- Adapt management measures according to monitoring information.

20. Public Power Council

GOAL

Best possible balance between biological integrity, genetic diversity and sustainable, naturally reproducing fish and wildlife, with due consideration for economic and social constraints.

OBJECTIVES

- Institute effective governance;
- Develop a unified plan;
- Establish fish and wildlife objectives
- Protect the environmental
- Foster economic and social vitality.

STRATEGIES

- **Management:** Top-down decision making by federal, state and tribal entities coordinated with bottom-up input in planning and management, especially on habitat; decisions incorporate performance measure.
- **Fish and wildlife generally:** Clarify purpose of mitigation; consider entire life cycle and ecosystem; take actions with measurable results; and balance resident fish and wildlife values.
- **Naturally spawning fish and wildlife:** set escapement for watershed populations; use metapopulations as level of organization; expand from existing, strong core populations, giving lower priority to weaker populations; emphasize areas with highest potential for increasing numbers of fish and most native species; give more attention to ocean and estuary; ensure natural escapement; protect good habitat and restore degraded habitat; minimize hydro impacts.
- **Harvest:** manage to minimize impacts to natural fish and coordinate management regionally and internationally.
- **Environment:** view actions globally and recognize trade-offs.
- **Economic and social:** emphasize actions that promise most benefit, cost less, disrupt less, use existing institutions, have performance goals and end points, and are most efficient. Compensate adversely affected parties.

MANAGEMENT ACTIONS

None identified.

**21. Port of Vancouver and Shaver
Transportation Co.**

GOAL

Maintain navigability

OBJECTIVES

- Improve quantity and quality of habitat (culverts at road crossings, removing obsolete structures like Condit);
- Don't draw down any mainstem dams; and
- Reduce predation by, i.e., terns.

STRATEGIES

None identified

MANAGEMENT ACTIONS

None identified

22. Melo Maiolie

GOAL

Use mitigation funds for problems caused by the federal hydro system;

Focus recovery efforts where hydro impacts are greatest

Make recovery long lasting

Operate hydro system so anadromous and resident species are not in competition.

OBJECTIVES

- Put 70% of total funds into on-the-ground activities and limit monitoring and evaluation to 15-25% of budget
- 80% or more of recovery efforts should mitigate direct effects of the hydro system
- Recovery efforts should match hydro impacts
- 70% of funds should go to long-lasting solutions for hydro problems
- Improve anadromous and resident species to at least 75% of historic levels
- Put priority on restoring production in natural lakes.

STRATEGIES

- Streamline BPA, NPPC, CBFWA and ISRP to use less than 5% of funds; and impose maximum of 25% overhead on individual projects;
- Put low priority on projects with high monitoring costs
- TBFWA develop formula for recovery efforts based on miles of rivers impacted, acres of reservoir created, wildlife units lost, and allocate funds accordingly
- Put highest priority on protecting fish that reproduce in the wild, lower priority on hatchery supplementation, and lowest priority to long-term hatchery programs with low potential to be self-sustaining;
- Consider all fish populations together when considering changes in hydro operations to avoid helping one ad hurting another.

MANAGEMENT ACTIONS

None identified.

23. John R. Skalski, University of Washington

GOAL

An experimental approach to stream recovery that uses best technology across a range of conditions, using individual streams as replicate experimental units, with monitoring and

evaluation to improve recovery strategies.

OBJECTIVES

- Stream-wide recovery measured by adult salmon returns, spawner-recruit ratios and fingerling-adult ratios (integrated responses of fecundity and survival) in an adaptive management framework
- Using field trials to assess whether remediation actions enhance responses over untreated streams
- Using a stair-step design to test progressively better strategies.

STRATEGIES

- With a large number of candidate streams and annual resources to address only a fraction each
- Year
- Aim for replication and randomization
- Evaluate survival and fecundity
- Systematically measure water quality, biotic responses of invertebrates and habitat quality.

MANAGEMENT ACTIONS

- Best available technology used to improve stream quality in randomly selected streams, via
- fencing, reducing irrigation withdrawal, enhancing riffles and gravels, returning nutrients via
- carcasses.
- Measure results annually using pre-established decision rules and time frames.
- Use different actions in different subsets of streams to compare strategies and cost-effectiveness.

24. Scott O’Daniel, Confederated Tribes of Umatilla Indian Reservation

GOAL

Improve land management decisions by analyzing and maintaining watershed and sub-watershed data.

OBJECTIVES

- Construct a suite of coarse scale ecological characterizations for each watershed;
- Identify relevant, available data;
- Develop functional thresholds that characterize significant, measurable changes;
- Review and publish case studies that link abstract and empirical models; and
- Target ecological functions and patterns at critical/ESA spatial scales.

STRATEGIES

None identified

MANAGEMENT ACTIONS

None identified

25. Columbia River Alliance

GOAL

Rebuilt salmon and steelhead hurt by human activity; maintain multiple purpose benefits of river; develop detailed subbasin plans using best science in most cost-effective way.

OBJECTIVES

- Develop/implement a plan to increase spawning runs of salmon and steelhead, complying with federal law and maintaining resident fish and wildlife populations;
- improve passage at dams;
- provide more scientific certainty to mitigation;

- implement measures with least cost, highest biological benefit;
- expand monitoring and evaluation;
- maintain river's public benefits: hydropower, irrigation and increased consumptive use, navigation to existing ports, recreation and flood control.

STRATEGIES

- **Immediate actions:**
 - maximize transportation and reduce ineffective spill;
 - investigate surface collection;
 - reduce predation in mainstem and estuary;
 - expand genetic diversity by increasing escapement to allow fully-seeded habitat;
 - reduce mixed stock fishery, mark all hatchery fish;
 - complete subbasin plans and use watershed councils, CRP and incentives for landowners and others to improve riparian habitat
- **Basin-wide salmon management:**
 - establish a regional entity to design and manage salmonid recovery;
 - use research and monitoring to improve models for analysis and prediction;
 - chose cost-effective measures;
 - decentralize habitat decisions to watersheds, categorize habitat into "nature preserve" and "production/supplementation;" manage harvest to protect weak stocks;
 - use models to predict extinction prospects for listed stocks;
 - restructure hatchery management;
 - link habitat restoration and stock management to fully seed "nature preserve" areas and report results.

MANAGEMENT ACTIONS

None identified.

26. Murphy & Buchal: Goldendale, Kaiser, Northwest & Reynolds Aluminum

GOAL

Increase multiple benefits of dams and river through common sense application of quantifiable data.

OBJECTIVES

- Increase hydro production
- Increase salmon and steelhead
- Improve harvest, habitat and hatchery management
- Maintain existing irrigation and allow more consumptive water use
- Maintain navigation to river ports
- Experiment, gather useful data.

STRATEGIES

- **Generally:**
 - Quantify benefits and costs of proposed measures;
 - implement f/w measure based on cost-effectiveness;
 - improve measurements of survival to identify high mortality areas;
 - use computer models to organize data and depict relationships to enable prediction;
 - use metapopulation models to predict extinction prospects for listed stocks.
- **Reorient management to meet legal requirements:**
 - Manage harvest to protect weak stocks;
 - manage hatcheries to achieve objectives;
 - sort habitat into "nature preserve" and production categories;
 - decentralize habitat decisions, focus regional decisions on interjurisdictional issues, limit hydropower funding to offsetting effects of hydropower.

MANAGEMENT ACTIONS

- **Mainstem:**
 - Focus on “hot spots” of mortality;
 - abandon spring flow augmentation and real-time flow management;
 - experiment with late summer/fall flow augmentation in low water years, using BPA contingency fund; maximize transportation, reduce spill at collector facilities, experiment with release sites;
 - optimize project-specific spill at non-collector facilities;
 - reactivate sluiceway passage, expand surface collection; replace old turbines with fish-friendly turbines;
 - assess natural mortality to distinguish human mortality
- **Hatcheries:**
 - unify reporting and measure success by returns to watersheds;
 - mark all hatchery fish;
 - fund genetic research to increase fish size, improve disease resistance, adapt to warm temperatures, increase abundance;
 - install spawning channels below tailraces;
 - expand existing mainstem spawning areas;
 - share tag revenues with hatcheries that return fish to watersheds;
 - move management to tribes;
 - declare some tributaries off limits to hatchery production and others as production/supplementation watersheds.
- **Harvest:**
 - Stop wild harvest, adopt tributary-specific escapement goals;
 - eliminate ocean harvest;
 - redirect lower river mixed stock harvest to terminal areas;
 - redirect tribal mixed stock harvest to ladder and tributary fishing;
 - buy selective gear for harvesters;
 - unify policing under US v. OR.
- **Habitat:**
 - Leave habitat issues to local level; abandon wildlife mitigation;
 - BPA Environmental Foundation fund habitat; evaluate cost-effectiveness of natural vs. artificial production.
- **Generally:**
 - Target research on project-specific effects;
 - expand passage models to whole life cycle;
 - build metapopulation models;
 - introduce mammalian predators to control terns;
 - allow limited marine mammal hunting.

27. Northwest Irrigation Utilities & Pacific Northwest Waterways Association

GOAL

Strong anadromous metapopulation that allow harvest; sustained resident fish; rebuilt weak stocks where cost is justified; river supports full spectrum of uses; hydro system is maintained and improved and supports ecosystem recovery consistent with integrated plan; and region has an effective governance mechanism that operates to protect the river system, treaty rights and state water rights.

OBJECTIVES

- **Funding:** Dependable, long-term PMA and other funding for ecosystem recovery;
- **Management:** Existing entities coordinate efforts assume accountability and put a new system of financial management in place. Federal, state and tribal authorities maintained, stipulating that plan compliance satisfies ESA and Clean Water Act.

- **Ocean & estuary:** Maximize survival below Bonneville, emphasize actions with clear and immediate benefit for fish, including reduced ocean harvest and bird predation, and improve understanding of estuary.
- **Hatcheries:** Use to recover natural populations and provide harvest while protecting genetic diversity.
- **In-river harvest:** Optimize harvest while ensuring long-term viability of natural stocks.
- **Habitat:** Improve tributary habitat, providing financial incentives to landowners.
- **Water management:** Improve biological benefits, reduce societal costs, respect state law, emphasize watershed efforts and water transfers.
- **Hydro system:** Selectively improve system and operations, expand transportation

STRATEGIES

- **Funding:** Maintain regional influence over PMA to assure adequate funding, promote other funding.
- **Management:** Use NPPC or a successor to oversee plan, clarify authority with other jurisdictions. Once plan is developed, develop an executive order stipulating ESA and Clean Water compliance.
- **Ocean & estuary:** improve survival below Bonneville including selective decreases in ocean and estuary harvests.
- **Hatcheries:** Emphasize wild fish and supplementation in selected tributaries using production to support terminal harvest, not as replacement for natural spawners, and minimizing impacts on wild stocks.
- **In-river Harvest:** Reduce mixed-stock fisheries, ensure natural escapement, increase fishing and catch value; reduce fishery capitalization.
- **Habitat:** Substantially expand funding for spawning, rearing and migration habitat.
- **Water management:** Restructure BiOp flow program to protect mainstem fish while spending more on tributary mitigation with comparable biological benefits and using incentives for collaboration.
- **Hydro system:** Increase transportation and mix with spill, passage, and turbine passage improvement.

MANAGEMENT ACTIONS

- **Funding:** Commit up to \$500 million/yr. From BPA over 10-year period; assure continued availability of BPA contingency fund; protect BPA or create a regional entity to assume its role; leverage private and other funds.
- **Management:** Create entity with full regional support and tribal representation to pursue recovery in cooperation with governments and participation by interest groups; allocate funds between foregone revenues and expenditures; develop criteria for projects, monitoring and evaluation based on integrated plan, best science, judgment and balancing diverse uses; decisions not bound by operating agencies' perspectives; and consider a 3rd-party fiduciary to manage funds.
- **Ocean & estuary:** increase use of estuary for acclimation of transported fish; increase use of Young's Bay for terminal fishing; discourage terms on Rice Island; selectively decrease ocean harvest, providing incentives not to fish during return periods for certain stocks; research on ocean effects.
- **Hatcheries:** Set performance standards based on returns, emphasizing wild fish; use innovative release strategies to provide harvest; develop comprehensive plan for basin; close won under-performing facilities; implant hatchery releases to reduce mixed-stock fishing; supplement under-seeded spawning areas; centralize incubation and rearing while increasing acclimation facilities; use low-cost, low technologies.
- **In-river harvest:** manage for escapement to spawning grounds; protect treaty rights and Zone 6 harvest; develop terminal fisheries; buy back commercial license; improve selective gear; provide incentives for reduced commercial fishing; provide sport fishing; use in-season

stock assessment to manage fisheries; mark all hatchery fish; augment below-Bonneville releases with upriver fish.

- **Habitat:** Support watershed processes in Oregon and Washington plans; endow trust to fund private, local and tribal improvements; develop partnerships with timber companies, farmers, ports, tribes, towns and others; coordinate with federal and state assistance programs.
- **Water management:** Eliminate BiOp spring-summer flow targets; evaluate biological benefits of Snake flow targets; fish managers establish flow augmentation for low water years, protect upstream resident species; priority on funding watershed capital improvements that help fish by improving stream conditions; respect hydrological conditions.
- **Hydro system:** various measures to increase transportation; bypass and turbine improvements at specific dams; moderated spill at collector projects, spill abatement measures

28. Clousten Energy Research

GOAL

Conservation of water taken for irrigation, stock watering and other purposes could be benefiting the habitat of multiple species. Application of existing technology and programs with innovative approaches when coordinated will provide improvements to water quality, affecting the aquatic environment of species throughout their life cycle. Conservation supports communities and economic development opportunities in some cases.

OBJECTIVES

- Improve water quality and quantity
- Improve acceptance of installation of fish screens
- Improve conservation of natural resources

STRATEGIES

- Apply conservation and enhancement measures for dams to water management activities and facilities, where applicable
- Establish adequate instream flow conditions for salmon by using, for example, the Instream Flow Incremental Methodology
- Undertake efforts to purchase or lease, from willing sellers and lessors, water rights necessary to maintain instream flows in accordance with appropriate state and federal laws
- Identify and use appropriate water conservation measures in accordance with state law
- Install totalizing flow meters at major diversion points. For water withdrawn from reservoirs, install gauges that identify the water surface elevation range from full reservoir to dead pool storage elevation. Additionally, if the reservoir is located in-channel, install gauges upstream and downstream of the reservoir
- Screen water diversions on all fish-bearing streams
- Incorporate juvenile and adult salmon passage facilities on all water diversions

MANAGEMENT ACTIONS

- Support for pilot projects ought to be improved
- Cooperation with the private sector needs to be encouraged
- Conservation of natural resources is smart

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Appendix D: Major Comment Issues/Framework Concept Papers

C. Framework Concept Papers By Action Areas

The following table is a copy of the spreadsheet provided by the Framework workgroup. It shows the basic fish recovery elements of the different concept papers side by side.

ACTIVITY OR OBJECTIVE	CONCEPT PAPER NUMBER (See Table B above)																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
HYDRO																											
Breach Lower Snake Dams	X	X	X	X	X	X				X																	
Provide passage at Grand Coulee and Chief Joe							X						X														
John Day at spillway crest	X		X	X	X	X	X			X																	
John Day at MIP		X																									
Additional flows	X	X			X	X	X			X																	
Secure Canadian storage		X					X			X																	
End/reduce juvenile transportation	X	X	X		X																						
24 hr. spill from Priest downstream		X																									
Meet fish passage efficiency objectives							X								X												
Water temperature control	X		X				X	X	X	X																	
Install gas abatement facilities		X			X	X	X			X		X															X
Improve turbine efficiencies	X					X	X			X																	X
Improve adult/juvenile passage	X	X			X	X	X			X	X							X							X		X
Install fish-friendly turbines						X				X	X															X	
Implement IRC's/VARQ		X					X																				
Manipulate water levels to protect spawning		X					X					X															
Modify flood control operations		X								X																	
Stabilize reservoir levels				X																							
Maintain navigability (dams in)							X								X						X				X	X	
Maximize/increase juvenile transportation																									X	X	X
Expand surface collection							X																			X	

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Appendix D: Major Comment Issues/Framework Concept Papers

ACTIVITY OR OBJECTIVE	CONCEPT PAPER NUMBER (See Table B above)																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Reduce reservoir drafts and improve refill								X																				
Transport only in low flow years					X																							
Reduce/optimize spill																										X	X	
Abandon/reduce spring flow augmentation																											X	X
Redesign hydro projects															X													
Eliminate flow augmentation		X																										
Increase hydro production											X																X	
HATCHERIES																												
Biological priorities for naturally spawning fish	X						X		X	X		X		X								X						X
Improve hatchery Operations/mgt.	X									X																X	X	
Use Supplementation	X		X	X	X																	X				X		X
Reduce use of hatcheries		X			X	X				X												X						X
Mark all hatchery fish										X																X	X	X
White sturgeon hatchery			X																									
Spawning channels below tailraces																											X	
HABITAT																												
Support normative river conditions	X	X	X	X	X	X		X	X	X											X							
Protect/restore/acquire habitat	X		X	X	X	X	X	X		X						X			X	X			X		X			X
Meet water quality standards	X		X							X					X													
Expand existing mainstem spawning areas		X								X																	X	
Screen diversions	X									X																		
Limit water diversions			X							X									X									
Restore tributary flows	X		X							X							X						X					
Reduce pollution			X							X																		
Reduce predation	X		X																		X					X	X	X
Control land use			X							X												X						

Fish and Wildlife Implementation Plan DEIS

Appendix D: Major Comment Issues/Framework Concept Papers

ACTIVITY OR OBJECTIVE	CONCEPT PAPER NUMBER (See Table B above)																											
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
Provide habitat incentives										X																X	X	X
Local watershed approach										X			X														X	X
Restore/consider estuary habitat	X		X							X										X		X						X
Delineate hatchery and natural production watersheds													X														X	
Conduct watershed audits										X																		
Clean reservoir spawning gravels																			X									
More consumptive water use																										X	X	
Abandon Wildlife mitigation																												
HARVEST																												
Insure harvestable stocks	X	X	X	X	X	X	X					X	X											X				X
Improve harvest management	X		X							X										X							X	
Protect/increase escapement	X					X				X			X						X	X						X		X
Develop known stock fisheries					X		X			X																	X	X
Manage to weak stocks				X						X																X	X	
Abundance based harvest			X		X	X				X														X		X	X	X
OTHER																												
Restore salmon to historic abundance			X																									
Recover ESA stocks		X				X			X	X			X															
Protect/expand metapopulations		X				X				X			X							X								X
Enforce existing laws (e.g. CWA)	X			X	X		X			X																		X
Changes in or new laws needed										X			X						X									
Multi-species approach/protection		X		X		X	X	X	X	X			X										X					
Lamprey research/restoration			X			X	X			X																		
Comprehensive native resident fish program		X								X		X	X		X													
Better cost effectiveness		X								X			X	X						X						X	X	X
Compensate adversely affected parties							X			X										X								
Prioritize cost-effective implementation										X								X								X		
Implement PATH results		X						X																				

Fish and Wildlife Implementation Plan DEIS
Appendix D: Major Comment Issues/Framework Concept Papers

ACTIVITY OR OBJECTIVE	CONCEPT PAPER NUMBER (See Table B above)																										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Diversify funding sources										X					X												X
"Reverse Staircase" approach						X																					
Establish genetic reservations								X		X																	
Reduce commodity subsidies	X																										
Maintain affordable, cost-based power	X	X			X						X				X												
Sustainable farming					X																						
Better governance structure											X				X					X					X		X
Establish a Biodiversity Institute											X																
Create artificial flows in reservoirs																											
Foster economic/social vitality																X				X						X	
Maintain irrigation					X																					X	X
Stipulate ESA & CWA compliance											X																X

Appendix E

Regional Energy Generation Resources

The following information is on regional electric energy resources. It is provided in two listings to address the existing generation and planned generation.

- Table A lists the existing generation by type of generation, date of energization, megawatt capacity, and location.
- Table B lists the planned generation by type of generation, date of proposed energization, megawatt capacity, and state.

Together, these tables should give a good idea of the energy resource picture for the region.

Table A: Northwest Power Planning Council Power Plants in the Pacific Northwest
(Including Canadian hydropower projects in the Columbia R. Basin, April 2001)

<i>PROJECT</i>	<i>PRIMARY RESOURCE</i>	<i>INSTALLED CAPACITY</i>	<i>SERVICE DATE</i>	<i>SITE</i>	<i>COUNTY</i>	<i>STATE</i>
Aberfeldie	Hydro	5.0	1922	Bull R.		BC
Afton Generating Co. 1	Wood Residue	7.5	1983	Afton	Lincoln	WY
Akolkolex	Hydro	10.0	1995	Akolkolex R.		BC
Albeni Falls	Hydro	42.6	1955	Pend Oreille R.		ID
Alder	Hydro	50.0	1945	Nisqually R.		WA
Amalgamated Sugar (Nampa) 1 - 3	Coal	9.3	1968	Nampa	Canyon	ID
Amalgamated Sugar (Nyassa) 1 - 3	Coal	14.0	1942	Nyassa	Malheur	OR
Amalgamated Sugar (Paul)	Natural Gas	5.5		Paul	Minidoka	ID
Amalgamated Sugar (Twin Falls) 1-3	Coal	7.0	1994	Twin Falls	Twin Falls	ID
Amy Ranch	Hydro	0.7	1986	Deep Cr.	Butte	ID
Anderson Ranch	Hydro	40.0	1950	Boise R.	Elmore	ID
American Falls	Hydro	92.4	1978	Snake R.	Power	ID
Ashton	Hydro	7.4		Henrys Fk.		ID
Atlanta Power Station	Hydro	0.2	1910	Boise R, M Fk	Elmore	ID
Auberry Energy	Wood Residue	7.5	1985	Fresno		ID
Barber Dam	Hydro	3.7	1989	Boise R.		ID
Barney Creek	Hydro	0.1	1986	Barney Cr.	Park	MT
Beaver	Natural Gas	586.2	1977	Clatskanie	Columbia	OR
Bend Power	Hydro	1.1	1913	Deschutes R.	Deschutes	OR
Bethel 1	Fuel Oil	(56.7)	1973	Salem	Marion	OR
Bethel 2	Fuel Oil	(56.7)	1973	Salem	Marion	OR
BGI (Yellowstone Energy)	Pet Coke	64.0	1995	Billings	Yellowstone	MT
Big Cliff	Hydro	18.0	1954	N. Fk. Santiam R.	Linn	OR
Big Creek Lodge	Hydro	0.0	1964	McCorkle Cr.	Valley	ID
Big Elk Creek YMCA Camp	Hydro	0.0	1987	Big Elk Cr. Trib.	Bonneville	ID
Big Fork	Hydro	4.2	1910	Swan R.	Flathead	MT

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Big Hanaford	Natural Gas	248.0	2002	Centralia	Lewis	WA
Big Sheep Creek	Hydro	1.6	1985	Big Sheep Cr.	Stevens	WA
Biggs' Creek	Hydro	0.0	1987	Biggs Cr.	Clark	WA
Billingsley Creek	Hydro	0.3	1986	Billingsley Cr.	Gooding	ID
Biomass One	Wood Residue	25.0	1986	White City	Jackson	OR
Birch Creek	Hydro	2.7	1987	Birch Cr.	Clark	ID
Birch Creek A	Hydro	0.0	1984	Birch Cr.	Gooding	ID
Birch Creek B	Hydro	0.1	1984	Birch Cr.	Gooding	ID
Black Canyon	Hydro	10.0	1986	Payette R.	Gem	ID
Black Canyon No. 3	Hydro	0.1	1983	N. Gooding Main Cnl.		ID
Black Creek	Hydro	3.7	1994	Black Cr.	King	WA
Black Eagle	Hydro	16.8	1927	Missouri R.		MT
Blind Canyon	Hydro	1.2	1992	Blind Canyon Spr.	Gooding	ID
Bliss	Hydro	75.0	1949	Snake R.	Gooding	ID
Blue Mountain Forest Products	Wood Residue	(3.5)	1986	Long Creek	Grant	OR
Boardman	Coal	560.0	1980	Boardman	Morrow	OR
Boise Cascade (Emmett)	Wood Residue	14.0	1985	Emmett	Gem	ID
Boise Cascade (LaGrande)	Wood Residue	4.6		La Grande	Union	OR
Boise Cascade (Medford)	Wood Residue	(8.5)	1961	Medford	Jackson	OR
Boise Diversion	Hydro	1.5	1912	Boise R.		ID
Bonneville	Hydro	1050.4	1938	Columbia R.		OR/WA
Bonneville Fishway	Hydro			Columbia R.		OR/WA
Bonnington Falls	Hydro	16.0		Kootenay R.		BC
Boulder Creek	Hydro	0.4	1984	Boulder Cr.	Lake	MT
Boundary	Hydro	1039.8	1967	Pend Oreille R.		WA
Boundary	Fuel Oil	0.8		Boundary Dam	Pend Oreille	WA
Box Canyon	Hydro	0.6	1983	Box Canyon Spr.		ID
Box Canyon Dam	Hydro	60.0	1955	Pend Oreille R.	Pend Oreille	WA
Bozeman Woodwaste	Wood Residue	12.0	1985	Bozeman	Gallatin	MT

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
BP Cherry Point Ics	Fuel Oil	26.0	2000	Blaine (Cherry Point Refinery)	Whatcom	WA
Bremerton Wastewater	Wastewater Gas	0.1		Bremerton	Kitsap	WA
Briggs	Hydro	(0.3)	1986	Teton Cnl.	Fremont	ID
Briggs Creek	Hydro	0.8	1985	Briggs Cr.	Gooding	ID
Brilliant	Hydro	129.0	1944	Kootenay R.		BC
Broadwater	Hydro	10.0	1989	Missouri R.		MT
Brownlee	Hydro	585.4	1958	Snake R.		ID/OR
Brunswick Creek	Hydro	0.0	1982	Brunswick Canyon Cr.	Washington	OR
Bull Run	Hydro	21.0	1912	Sandy R.	Clackamas	OR
Bull Run No. 1 (Portland Hydro)	Hydro	23.8	1981	Bull Run R.	Multnomah/Clackamas	OR
Bull Run No. 2 (Portland Hydro)	Hydro	11.9	1982	Bull Run R.	Multnomah/Clackamas	OR
Burnham Creek	Hydro	0.0		Burnham Cr.	Pacific	WA
Burrill Lumber	Natural Gas	1.5	1990	White City	Jackson	OR
Burton Creek	Hydro	0.8	1996	Burton Cr.	Lewis	WA
Bypass	Hydro	10.0	1988	N. Side Main Cnl.	Jerome	ID
C.J. Strike	Hydro	82.8	1952	Snake R.	Owyhee	ID
Cabinet Gorge	Hydro	231.3	1952	Clark Fork R.	Bonner	ID
Calispell Creek	Hydro	1.0		Calispell Cr.		WA
Canal Creek	Hydro	(1.1)	1984	Wallowa Valley Imp. Dist. Cnl.	Wallowa	OR
Canyon Creek	Hydro	0.1	1985	Canyon Cr.	Clackamas	OR
Canyon Ferry	Hydro	50.0	1953	Missouri R.	Lewis & Clark	MT
Carmen-Smith	Hydro	104.5	1963	McKenzie R.	Linn	OR
Cascade	Hydro	12.4	1926	Payette R. N. Fk.	Valley	ID
Cascade Creek	Hydro	0.1	1983	Cascade Cr.	Park	MT
Cedar Draw Creek	Hydro	2.9	1985	Cedar Draw Cr.	Twin Falls	ID
Cedar Falls (Masonry Dam)	Hydro	30.0	1905	Cedar R.	King	WA
Central Oregon Siphon	Hydro	5.5	1989		Deschutes	OR
Centralia 1	Coal	730.0	1971	Centralia	Lewis	WA

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Centralia 2	Coal	730.0	1972	Centralia	Lewis	WA
Cereghino (John Day Creek)	Hydro	1.1	1987	John Day Cr.	Idaho	ID
Champion International - Libby	Wood Residue	17.0	1960	Libby	Lincoln	MT
Champion International - Milltown (Bonner)	Wood Residue	2.2		Milltown	Missoula	MT
Chandler	Hydro	12.0	1956	Yakima R. (Off-stream)	Benton	WA
Chelan	Hydro	48.0	1928	Chelan R.	Chelan	WA
Chelan Ics	Fuel Oil	33.6	2001	McKenzie Switchyard	Chelan	WA
Chief Joseph	Hydro	2075.0	1955	Columbia R.	Douglas	WA
City of Albany	Hydro	0.5	1923	S. Santiam R.	Linn	OR
Clear Lake	Hydro	2.5	1937	Snake R. (Off-stream)	Gooding	ID
Clearwater 1	Hydro	15.0	1953	Clearwater R.	Douglas	OR
Clearwater 2	Hydro	26.0	1953	Clearwater R.	Douglas	OR
Clearwater Hatchery	Hydro	2.5		N.Fk. Clearwater R.	Clearwater	ID
Cline Falls	Hydro	1.0	1913	Deschutes R.	Deschutes	OR
Cochrane	Hydro	48.0	1957	Missouri R.	Cascade	MT
Coffin Butte	Landfill Gas	2.0	1995	Coffin Butte Landfill	Benton	OR
Collins Wood Products - Klamath Falls	Wood Residue	7.5		Klamath Falls	Klamath	OR
Colstrip 1	Coal	333.0	1975	Colstrip	Rosebud	MT
Colstrip 2	Coal	333.0	1975	Colstrip	Rosebud	MT
Colstrip 3	Coal	718.0	1984	Colstrip	Rosebud	MT
Colstrip 4	Coal	718.0	1986	Colstrip	Rosebud	MT
Columbia Generating Station (nee)WNP-2	Uranium	1216.0	1984	Hanford	Benton	WA
Company Creek	Hydro	0.2		Company Cr.	Chelan	WA
Condit	Hydro	14.7	1913	White Salmon R.	Klickitat	WA
Coos County MSW	MSW		1986		Coos	OR
COPCO 1	Hydro	20.0		Klamath R.	Siskiyou	CA
COPCO 2	Hydro	27.0		Klamath R.	Siskiyou	CA
Corra Linn	Hydro			Kootenay R. (Kootenay L.)		BC
Cougar	Hydro	25.0	1964	McKenzie R.	Lane	OR

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Cove	Hydro	0.0	1917	Bear R.	Caribou	ID
Cowiche Hydroelectric Project	Hydro	1.5	1986	Tieton R.	Yakima	WA
Cowlitz Falls	Hydro	70.2	1994	Cowlitz R.	Lewis	WA
Coyote Springs 1	Natural Gas	237.0	1995	Boardman	Morrow	OR
Coyote Springs 2	Natural Gas	280.0	2002	Boardman	Morrow	OR
Crater Lake Lumber Company	Wood Residue	2.5		Chiloquin	Klamath	OR
Crown Pacific (Formerly Gilchrist)	Wood Residue	1.5		Gilchrist	Klamath	OR
Crystal Mountain	Fuel Oil	2.8	1973	Crystal Mountain Ski Area	Pierce	WA
Cushman 1	Hydro	50.0	1926	Skokomish R. N. Fk.	Mason	WA
Cushman 2	Hydro	81.0	1930	Skokomish R. N. Fk.	Mason	WA
D.R. Johnson - Riddle (Cogen II)	Natural Gas	7.5	1987	Riddle	Douglas	OR
Daishowa	Fuel Oil			Port Angeles	Clallum	WA
DAW (Diamond Int.) Forest Products	Wood Residue	10.0	1960	Bend	Deschutes	OR
Deep Creek	Hydro	0.3	1983	Deep Cr.	Stevens	WA
Denny Creek	Hydro	0.1	1985	Denny Cr.	Klamath	OR
Detroit	Hydro	100.0	1953	N. Fk. Santiam R.	Linn	OR
Dexter	Hydro	15.0	1955	M. Fk. Willamette R.	Lane	OR
Diablo	Hydro	152.8	1936	Skagit R.		WA
Diamond Creek	Hydro	0.0	1988	Diamond Cr.	Whatcom	WA
Dietrich Drop	Hydro	4.8	1988	Milner-Gooding Cnl.		ID
Doug Hull	Hydro	0.3	1983	Twin Falls Cnl Lateral 28		ID
Dry Creek	Hydro	3.6	1987	Dry Cr.	Butte	ID
Dry Creek	Hydro	(0.0)	1980	Dry Cr.		MT
Duncan	Hydro	0.0	1967	Duncan R.		BC
Dworshak	Hydro	400.0	1974	Clearwater R.		ID
Dworshak (Clearwater Hatchery)	Hydro	2.9	2000	N.Fk. Clearwater R.	Clearwater	ID
Eagle Point	Hydro	2.8	1957	Little Butte Cr.	Jackson	OR
East Fork Ditch	Hydro	(2.5)	1994	E. Fk. Weiser R.		ID

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
East Side	Hydro	3.2	1924	Klamath R.	Klamath	OR
Eastsound	Fuel Oil	1.3		Eastsound	San Juan	WA
Ebey Hill	Hydro	0.1	1992	Trib to N. Fk Stillaguamish	Snohomish	WA
EBR-II	Uranium			INEL		ID
Edward Hines Lumber	Wood Residue			Westfir	Lane	OR
Electron	Hydro	25.5	1904	Puyallup R.	Pierce	WA
Elk Creek	Hydro	2.3	1984	Elk Cr.	Idaho	ID
Elko	Hydro	12.0	1924	Elk R.		BC
Ellingson Lumber	Wood Residue	(2.8)		Baker City	Baker	OR
Eltopia Branch Canal 4.6	Hydro	2.2	1983	Eltopia Branch Cnl.		WA
Elwha Dam	Hydro	12.0	1913	Elwha R.		WA
Encogen 1-3	Natural Gas	160.0	1993	Bellingham	Whatcom	WA
Eugene/Springfield Wastewater	Wastewater Gas	0.8		Springfield	Lane	OR
Everett Cogeneration Project	Black Liquor	52.2	1995	Everett	Snohomish	WA
Evergreen Forest Products	Wood Residue	6.3	1983	New Meadows	Adams	ID
Fall Creek	Hydro	2.2	1910	Klamath R.	Siskiyou	CA
Fall River	Hydro	9.1	1993	Fall R.	Fremont	ID
Falls Creek	Hydro	0.0	1988	Falls Cr.	Clallum	WA
Falls Creek	Hydro	4.0	1984	Falls Cr.	Linn	OR
Faraday	Hydro	35.9	1907	Clackamas R.	Clackamas	OR
Farmers Irrigation District No. 2 (Copper Dam)	Hydro	3.0	1985	Farmers Ditch	Hood River	OR
Farmers Irrigation District No. 3 (Peters Drive)	Hydro	1.8	1986	Low Line Ditch	Hood River	OR
Faulkner	Hydro	0.9	1987	N. Side Main "Y" Cnl.	Gooding	ID
Felt	Hydro	7.5	1986	Teton R.	Teton	ID
Ferguson Ridge	Hydro	(1.9)	1984	Wallowa Valley Imp. Dist. Cnl.	Wallowa	OR
Fish Creek	Hydro	11.0	1952	Fish Cr.	Douglas	OR
Fisheries Development No. 1	Hydro	0.3	1990	Billingsley Cr.	Gooding	ID
Flint Creek	Hydro	1.1	1901	Georgetown Lk.	Granite	MT

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Flying W	Hydro	0.0	1979	Flying W. Irr. Ditch	Valley	ID
Foot Creek Rim I	Wind	41.4	1999	Arlington	Carbon	WY
Foot Creek Rim II	Wind	1.8	1999	Arlington	Carbon	WY
Foot Creek Rim IV	Wind	16.8	2000	Arlington	Carbon	WY
Ford (Jim Ford Creek)	Hydro	1.5	1987	Jim Ford Cr.	Clearwater	ID
Forgy	Hydro	0.1	1995	Unnamed Spring	Adams	ID
Fort Peck	Hydro	185.3	1943	Missouri R.	Valley/McCone	MT
Foster	Hydro	20.0	1968	S. Fk. Santiam R.	Linn	OR
Frank Bird	Natural Gas	(69.0)	1951	Billings	Yellowstone	MT
Frederickson 1	Natural Gas	85.0	1981	Parkland	Pierce	WA
Frederickson 2	Natural Gas	85.0	1981	Parkland	Pierce	WA
Fredonia 1	Natural Gas	123.6	1984	Burlington	Skagit	WA
Fredonia 2	Natural Gas	123.6	1984	Burlington	Skagit	WA
Galesville	Hydro	1.7	1987	Cow Cr.	Douglas	OR
Gem State	Hydro	22.3	1988	Snake R.	Bingham	ID
Geo-Bon No. 2	Hydro	1.1	1986	Little Wood R.		ID
Georgetown	Hydro	0.5	1985	Georgetown Cr.	Bear Lake	ID
Georgia-Pacific (Bellingham) lcs	Fuel Oil		2001	Bellingham (GP Mill)	Whatcom	WA
Georgia-Pacific (Camas)	Black Liquor	52.0	1995	Camas	Clark	WA
Georgia-Pacific (Lebanon)	Wood Residue	2.0		Lebanon	Linn	OR
Georgia-Pacific (Wauna)	Black Liquor	36.0	1996	Wauna	Clatsop	OR
Gillihan	Hydro	0.0		No Name Cr.	Valley	ID
Glines Canyon	Hydro	12.1		Elwha R.		WA
Goodrich	Hydro	0.1		Goodrich Cr.	Baker	OR
Gorge	Hydro	158.8	1924	Skagit R.		WA
Gorge Energy (SDS Lumber) 1	Wood Residue	3.5	1979	Bingen	Klickitat	WA
Gorge Energy (SDS Lumber) 2	Wood Residue	5.0	1985	Bingen	Klickitat	WA
Grace	Hydro	0.0	1923	Bear R.		ID
Grand Coulee	Hydro	6832.5	1941	Columbia R.		WA

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Grand Coulee (Pumped Storage)	Pmp Storage	314.4	1941	Columbia R.		WA
Grant Village	Fuel Oil	3.0		Yellowstone National Park	Yellowstone N.P.	WY
Great Western Malting	Natural Gas	(20.1)	1983	Vancouver	Clark	WA
Green Peter	Hydro	80.0	1967	M. Fk. Santiam R.	Linn	OR
Green Springs	Hydro	16.0	1960	Keene Cr.	Jackson	OR
Ground Water Pumping Station	Pmp Storage	4.5	1985	Bull Run (Offstream)	Multnomah	OR
Guy Bennett Lumber	Wood Residue			Clarkston	Asotin	WA
Hailey	Hydro	0.1	1985	Indian Cr.		ID
Hauser Lake	Hydro	17.0	1911	Missouri R.		MT
Hazelton A	Hydro	8.7	1990	N. Side Main Cnl.	Jerome	ID
Hazelton B	Hydro	7.6	1993	N. Side Main Cnl.	Jerome	ID
HE 257	Hydro	0.0		Francis Cr.	Douglas	OR
Helena Waste	MSW			Helena	Lewis & Clark	MT
Hellroaring (Big Creek)	Hydro	0.4	1916	Hellroaring Cr.	Lake	MT
Hell's Canyon	Hydro	391.5	1967	Snake R.		ID/OR
Henry M. Jackson (Culmback)	Hydro	111.8	1984	Sultan R.	Snohomish	WA
Hermiston Generating Project 1	Natural Gas	234.5	1996	Hermiston	Umatilla	OR
Hermiston Generating Project 2	Natural Gas	234.5	1996	Hermiston	Umatilla	OR
Hermiston Power Project 1 & 2	Natural Gas	536.0	2002	Hermiston	Umatilla	OR
Hettinger	Hydro	0.0	1960	Smith Cr.	Idaho	ID
Hills Creek	Hydro	30.0	1962	M. Fk. Willamette R.	Lane	OR
Holter	Hydro	38.4	1918	Missouri R.		MT
Hood Street	Hydro	0.9	1990	McMillan Reservoir	Pierce	WA
Horseshoe Bend	Hydro	9.5	1995	Payette R.	Boise	ID
Hugh Keenleyside	Hydro	0.0	1968	Columbia R.		BC
Hungry Horse	Hydro	428.0	1952	Flathead R.		MT
Husky Industries	Wood Residue	5.0	1989	White City	Jackson	OR
Ice Harbor	Hydro	603.0	1961	Snake R.		WA
Idaho Falls (City Plant)	Hydro	8.0	1982	Snake R.	Bonneville	ID

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Idaho Falls Lower	Hydro	11.0	1904	Snake R.	Bonneville	ID
Idaho Falls Upper	Hydro	8.0	1938	Snake R.	Bonneville	ID
Ingram Warm Springs Ranch A	Hydro	0.5	1986	Warm Spring Cr.	Custer	ID
Ingram Warm Springs Ranch B	Hydro	1.1	1986	Warm Spring Cr.	Custer	ID
IPC HQ PV	Solar	0.0	1994	Boise	Ada	ID
Iron Gate	Hydro	18.0		Klamath R.		CA
Island Park	Hydro	4.8	1993	Henrys Fk.	Fremont	ID
ITT Rayonier - Port Angeles	Black Liquor	13.0		Port Angeles	Clallum	WA
ITT Rayonier Greys Harbor Division	Wood Residue	(4.4)		Hoquiam	Grays Harbor	WA
J.E. Corrette	Coal	163.0	1968	Billings	Yellowstone	MT
James E. White (Derr Creek)	Hydro	0.3	1981	Derr Cr.	Bonner	ID
Jim Boyd	Hydro	1.2		Umatilla R.		OR
Jim Bridger 1	Coal	516.7	1974	Point of Rocks	Sweetwater	WY
Jim Bridger 2	Coal	516.7	1975	Point of Rocks	Sweetwater	WY
Jim Bridger 3	Coal	516.7	1976	Point of Rocks	Sweetwater	WY
Jim Bridger 4	Coal	516.7	1979	Point of Rocks	Sweetwater	WY
Jim Knight	Hydro	0.3	1984	S. Gooding Main Cnl.		ID
John C. Boyle	Hydro	80.0	1958	Klamath R.	Klamath	OR
John Day	Hydro	2160.0	1968	Columbia R.		OR/WA
John H. Koyle	Hydro	1.4	1983	Big Wood R.		ID
Kasel-Witherspoon	Hydro	1.4	1983	Snake R., Trib.		ID
Kaster Riverview	Hydro	0.4	1983	Box Canyon Spr.		ID
Kerr	Hydro	180.0	1938	Flathead R.		MT
Kettle Falls Generating Station	Wood Residue	57.0	1983	Kettle Falls	Stevens	WA
Kinzua	Wood Residue	10.0	1985	Heppner	Morrow	OR
Klamath Cogeneration Project	Natural Gas	484.0	2001	Klamath Falls	Klamath	OR
Koma Kulshan	Hydro	12.0	1990	Rocky Cr.		WA
Kootenay Canal	Hydro	559.0	1976	Kootenay Canal		BC
Lacomb	Hydro	1.0	1986	Lacomb Irr. Cnl.	Linn	OR

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LaGrande	Hydro	65.0	1912	Nisqually R.		WA
Lake	Fuel Oil	2.7	1967	Yellowstone National Park	Yellowstone N.P.	WY
Lake Creek A	Hydro	1.0	1917	Lake Cr.	Lincoln	MT
Lake Creek B	Hydro	3.5	1917	Lake Cr.	Lincoln	MT
Lake Creek No 1	Hydro	0.1	1984	Lake Cr.	Josephine	OR
Lake Oswego	Hydro	0.5	1910	Oswego Cr.	Clackamas	OR
Lane Plywood	Wood Residue	1.0	1982	Eugene	Lane	OR
Last Chance Canal	Hydro	1.7	1982	Bear R.		ID
Lateral No. 10	Hydro	2.9	1985	Lateral No. 10 Cnl.	Twin Falls	ID
Leaburg Dam	Hydro	15.0	1930	McKenzie R.	Lane	OR
Leishman Irrigation System	Hydro	0.0	1987	Irr. Collection System	Kittitas	WA
Lemolo 1	Hydro	29.0	1955	N. Umpqua R.	Douglas	OR
Lemolo 2	Hydro	33.0	1956	N. Umpqua R.	Douglas	OR
Lemoyne	Hydro	0.0	1985	Conyers Ditch	Gooding	ID
Libby	Hydro	525.0	1975	Kootenai R.		MT
Lilliwaup Falls	Hydro	1.8	1983	Lilliwaup Cr.	Mason	WA
Little Butte Ranch	Hydro	0.0		Little Butte Cr., N. Fk.	Jackson	OR
Little Falls	Hydro	32.0	1910	Spokane R.		WA
Little Gold	Hydro	0.5	1983	Little Gold Cr.	Granite	MT
Little Goose	Hydro	810.0	1970	Snake R.		WA
Little Mac	Hydro	1.6	1984	Cedar Draw	Twin Falls	ID
Little Wood R Ranch	Hydro	1.9	1986	Little Wood R.		ID
Little Wood Reservoir	Hydro	1.0	1988	Little Wood R.		ID
Long Lake	Hydro	71.0	1914	Spokane R.		WA
Longview Fibre - CR & Pwr Boilers 1-7	Black Liquor	72.0	1966	Longview	Cowlitz	WA
Longview Fibre - CT	Natural Gas	65.0	1995	Longview	Cowlitz	WA
Lookout Point	Hydro	120.0	1954	M. Fk. Willamette R.	Lane	OR
Lost Creek	Hydro	49.0	1977	Rogue R.	Jackson	OR
LOTT Wastewater	Wastewater Gas	0.5	1993	Olympia	Thurston	WA

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Louisiana-Pacific	Wood Residue	6.2		Missoula	Missoula	MT
Low Line Canal Drop	Hydro	8.0	1984	Low Line Cnl.	Twin Falls	ID
Lower Baker	Hydro	71.4	1925	Baker R.	Skagit	WA
Lower Bonnington	Hydro			Kootenay R.		BC
Lower Granite	Hydro	810.0	1975	Snake R.		WA
Lower Low Line No. 2	Hydro	2.8	1988	Low Line Cnl.	Twin Falls	ID
Lower Malad	Hydro	13.5	1905	Big Wood R.	Gooding	ID
Lower Monumental	Hydro	810.0	1969	Snake R.		WA
Lower Salmon Falls	Hydro	60.0	1910	Snake R.	Gooding	ID
LQ-LS Drains	Hydro	1.8	1984	LS Drain & LQ Drain	Twin Falls	ID
Lucky Peak	Hydro	101.3	1988	Boise R.		ID
Macks Creek	Hydro	0.0	1984	Macks Cr.	Boise	ID
Madison	Hydro	8.6	1907	Madison R.		MT
Magic Dam	Hydro	9.0	1989	Big Wood R.	Blaine	ID
Magic Valley	Natural Gas	10.0	1996	Rupert	Minidoka	ID
Magic West	Natural Gas	10.0	1996	Glens Ferry	Elmore	ID
Main Canal Headworks	Hydro	26.0	1986	Main Cnl.		WA
March Point 1	Refinery Gas	80.0	1991	Anacortes	Skagit	WA
March Point 2	Refinery Gas	60.0	1993	Anacortes	Skagit	WA
Marion Co. Resource Recovery	MSW	14.0	1986	Salem	Marion	OR
Marion Investment	Hydro	0.9		N. Santiam R.		OR
Marsh Valley	Hydro	1.7		Portneuf Marsh Valley Cnl.	Bannock	ID
Mayfield Dam	Hydro	162.0	1963	Cowlitz R.		WA
McKenzie	Hydro	4.0		McKenzie R.	Lane	OR
McNary	Hydro	980.0	1953	Columbia R.		OR/WA
McNary Dam Fish Attraction	Hydro	7.0	1997	Columbia R.	Benton	WA
Medford Wastewater	Wastewater Gas	0.7		Medford	Jackson	OR
Medite Corp.	Wood Residue	1.0		Medford	Jackson	OR
Merwin (Ariel dam)	Hydro	136.0	1931	Lewis R.		WA

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Meyers Falls	Hydro	1.2	1915	Colville R.	Stevens	WA
Mica	Hydro	1792.0	1977	Columbia R.		BC
Middle Fork Irrigation District 1	Hydro	0.6	1987	W. Evans Cr.	Hood River	OR
Middle Fork Irrigation District 2	Hydro	0.6	1987	Irr. Conduit	Hood River	OR
Middle Fork Irrigation District 3	Hydro	2.1	1987	Clear Branch	Hood River	OR
Mile 28	Hydro	1.8	1994	Milner-Gooding Cnl.	Jerome	ID
Mill Creek	Hydro	1.0	1984	Mill Cr.	Union	OR
Mill Creek	Hydro	0.6	1983	Mill Cr.		WA
Milltown	Hydro	4.0	1906	Clark Fork R.		MT
Milner A	Hydro	58.6	1993	Twin Falls Main Cnl.	Twin Falls	ID
Milner B	Hydro	0.8	1993	N. Side Main Cnl.	Twin Falls	ID
Minidoka	Hydro	27.6	1909	Snake R.	Minidoka	ID
Minikahda	Hydro	0.1		Minikahda Cr.	Clackamas	OR
Mink Creek	Hydro	3.1	1988	Mink Cr.	Franklin	ID
Mirror Lake	Hydro	1.0	1985	Nooksack R., M. Fk.		WA
Mitchell Butte	Hydro	1.9	1989	Mitchell Butte Lateral	Malheur	OR
Monroe Street	Hydro	14.8	1890	Spokane R.		WA
Montana One	Coal	43.7	1991	Colstrip	Rosebud	MT
Moroney	Hydro	45.0	1930	Missouri R.		MT
Morse Creek	Hydro	0.5	1988	Morse Cr.	Clallum	WA
Mossyrock	Hydro	300.0	1905	Cowlitz R.		WA
Mountain Home AFB PV	Solar	0.1	1995	Grasmere	Owyhee	ID
Moyie Falls 2 (Lower)	Hydro	0.2	1941	Moyie R.	Boundary	ID
Moyie Falls 1 (Upper)	Hydro	0.5	1921	Moyie R.	Boundary	ID
Moyie River	Hydro	1.5	1982	Moyie R.	Boundary	ID
Mt. Tabor	Hydro	0.2	1985	Mt. Tabor Res. No. 5	Multnomah	OR
Mud Creek A	Hydro	0.4	1982	Mud Cr.	Twin Falls	ID
Mud Creek B	Hydro	0.2	1982	Present Ditch	Twin Falls	ID
Mystic Lake	Hydro	10.0	1925	W. Rosebud Cr.	Stillwater	MT

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
N-32 (Northside Canal)	Hydro	0.6	1985	N. 32 Lateral Cnl.		ID
Naches	Hydro	6.4	1909	Wapato Cnl.	Yakima	WA
Naches Drop	Hydro	1.4	1914	Naches R.	Yakima	WA
Newhalem Creek	Hydro	2.1	1921	Newhalem Cr.	Whatcom	WA
Nichols Gap	Hydro	0.9	1986	Nichols Branch, Trib.	Jackson	OR
Nicholson	Hydro	0.5	1986	Uncle Ike Cr.	Butte	ID
Nine Mile	Hydro	26.4	1908	Spokane R.		WA
Nooksack	Hydro	1.5	1906	N. Fk. Nooksack R.	Whatcom	WA
North Fork	Hydro	40.8	1958	Clackamas R.		OR
North Fork Sprague River	Hydro	1.2	1989	Sprague R., N. Fk.	Klamath	OR
North Powder	Wood Residue	7.0	1985	North Powder	Baker	OR
North Side	Landfill Gas	0.9	1998	North Side Landfill	Spokane	WA
North Willow Creek	Hydro	0.4	1988	N. Willow Cr.	Madison	MT
Northeast 1 & 2	Natural Gas	61.2	1978	Spokane	Spokane	WA
Noxon Rapids	Hydro	466.2	1960	Clark Fork R.		MT
O.J. Power Company	Hydro	0.2	1986	Mill Cr.	Oneida	ID
Oak Grove (Three Lynx, Timothy)	Hydro	40.8	1924	Clackamas R., Oak Grove Fk.		OR
Ochoco Lumber Company	Wood Residue			Prineville	Crook	OR
Odell Creek	Hydro	0.2	1984	Odell Cr.	Hood River	OR
Old Faithful 1	Fuel Oil	1.0	1979	Yellowstone National Park	Yellowstone N.P.	WY
Old Faithful 2	Fuel Oil	1.0	1979	Yellowstone National Park	Yellowstone N.P.	WY
Oneida Narrows	Hydro	30.0	1915	Bear R.		ID
Opal Springs	Hydro	4.3	1920	Crooked R.		OR
Orchard Avenue	Hydro	1.4	1986	Tieton R.		WA
Oregon City	Hydro	1.5		Willamette R.		OR
Owyhee Dam	Hydro	4.3	1985	Owyhee R.		OR
Owyhee Tunnel No. 1	Hydro	8.0	1993	Owyhee Lk.		OR
Oxbow	Hydro	190.0	1961	Snake R.		ID/OR

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Packwood Lake	Hydro	26.1	1964	Lake Cr.	Lewis	WA
Palisades	Hydro	118.8	1957	Snake R.	Bonneville	ID
Paris	Hydro	0.7	1910	Weilenmann Cnl.	Bear Lake	ID
Pelton	Hydro	97.2	1957	Deschutes R.	Jefferson	OR
Pelton Reregulation Dam	Hydro	18.9		Deschutes R.	Jefferson	OR
Philips Ranch	Hydro					
Philipsburg A	Hydro	0.1	1981	Fred Burr Cr.(Off-stream)	Granite	MT
Philipsburg B	Hydro	0.1	1981	Fred Burr Cr.	Granite	MT
Pine Creek	Hydro	0.4	1975	Pine Cr.	Park	MT
Pine Products Corporation	Wood Residue	5.7	1989	Prineville	Crook	OR
Pocatello Wastewater	Wastewater Gas	0.1	1985	Pocatello		ID
Point Whitehorn 1	Fuel Oil	(61.0)	1974	Ferndale	Whatcom	WA
Point Whitehorn 2	Natural Gas	85.0	1981	Ferndale	Whatcom	WA
Point Whitehorn 3	Natural Gas	85.0	1981	Ferndale	Whatcom	WA
Ponds Lodge	Hydro	0.3	1936	Buffalo R. (Henrys Fk. Snake)	Fremont	ID
Port Townsend Paper 2	Black Liquor	3.5	1929	Port Townsend	Clallum	WA
Port Townsend Paper 4	Black Liquor	3.5	1929	Port Townsend	Clallum	WA
Port Townsend Paper 5	Black Liquor	7.5	1986	Port Townsend	Clallum	WA
Port Townsend Paper 6	Hydro	0.4	1982	Big Quilcene R.	Clallum	WA
Portneuf River	Hydro	0.9	1993	Portneuf R.	Bannock	ID
Post Falls	Hydro	14.8	1906	Spokane R.	Kootenai	ID
Potholes East Canal 66.0	Hydro	2.4	1985	Potholes E. Cnl.	Franklin	WA
Potholes East Canal Headworks	Hydro	6.5	1990	Potholes E. Cnl.	Grant	WA
Potlatch - Lewiston 1	Black Liquor	10.0	1950	Lewiston	Nez Pierce	ID
Potlatch - Lewiston 2	Black Liquor	9.2	1977	Lewiston	Nez Pierce	ID
Potlatch - Lewiston 3	Black Liquor	28.8	1981	Lewiston	Nez Pierce	ID
Potlatch - Lewiston 4	Black Liquor	65.0	1991	Lewiston	Nez Pierce	ID
Powerdale	Hydro	6.0	1923	Hood R.	Hood River	OR

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Prairie Wood Products (Cogen I)	Natural Gas	7.5	1986	Prairie City	Grant	OR
Preston	Hydro	0.4	1987	Berquist Spr.	Franklin	ID
Priest Rapids	Hydro	855.0	1959	Columbia R.	Grant	WA
Pristine Springs	Hydro	0.1		Well	Gooding	ID
Prospect 1	Hydro	3.8	1912	Rogue R. (Off-stream)	Jackson	OR
Prospect 2	Hydro	32.0	1920	Rogue R.	Jackson	OR
Prospect 3	Hydro	7.2	1932	Rogue R., S. Fk.	Jackson	OR
Prospect 4	Hydro	1.0	1944	Rogue R. (Off-stream)	Jackson	OR
Quality Veneer & Lumber 1 (Omack Wood Products)	Wood Residue	5.0	1974	Omak	Okanogan	WA
Quality Veneer & Lumber 2 (Omack Wood Products)	Wood Residue	7.5	1974	Omak	Okanogan	WA
Quincy Chute	Hydro	7.8	1984	West Cnl.	Grant	WA
Rainbow	Hydro	36.5	1910	Missouri R.	Cascade	MT
Rathdrum 1	Natural Gas	83.5	1995	Rathdrum	Kootenai	ID
Rathdrum 2	Natural Gas	83.5	1995	Rathdrum	Kootenai	ID
Rathdrum Power Project	Natural Gas	270.0	2001	Rathdrum	Kootenai	ID
Rayonier (ex Wood Power, Inc.)	Wood Residue	(6.8)	1983	Plummer	Benewah	ID
Reeder Gulch	Hydro	0.8	1985	Ashland Cr.	Jackson	OR
Revelstoke	Hydro	1980.0	1984	Columbia R.		BC
Reynolds Irrigation District	Hydro	0.4	1985	Reynolds ID Main Cnl.	Owyhee	ID
Richland Sewer	Wastewater Gas			Richland	Benton	WA
Rim View	Hydro	0.3	2000	Niagara Springs	Gooding	ID
River Mill	Hydro	19.1	1911	Clackamas R.	Clackamas	OR
River Road	Natural Gas	248.0	1997	Vancouver	Clark	WA
Rock Creek	Hydro	0.8	1905	Rock Cr.	Baker	OR
Rock Creek #1	Hydro	2.5	1983	Rock Cr.	Twin Falls	ID
Rock Creek #2	Hydro	1.9	1988	Rock Cr.	Twin Falls	ID
Rock Creek Wastewater	Wastewater Gas	0.3		Hillsboro	Washington	OR
Rock Island	Hydro	622.5	1933	Columbia R.	Chelan	WA
Rocky Brook	Hydro	1.2	1985	Rocky Brook	Jefferson	WA

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Rocky Reach	Hydro	1213.2	1961	Columbia R.	Chelan	WA
Roosevelt Landfill	Landfill Gas	8.4	1999	Roosevelt (Allied Landfill)	Klickitat	WA
Roseburg Forest Products - Dillard	Natural Gas	45.0	1955	Dillard	Douglas	OR
Ross	Hydro	338.6	1952	Skagit R.	Whatcom	WA
Ross Creek	Hydro	0.5	1996	Ross Cr.	Gallatin	MT
Round Butte	Hydro	300.0	1964	Deschutes R.	Jefferson	OR
Roza	Hydro	11.3	1958	Yakima R.	Kittitas	WA
Russell D. Smith	Hydro	6.1	1982	Potholes E. Cnl.	Adams	WA
Ryan	Hydro	48.0	1916	Missouri R.	Cascade	MT
Sagebrush	Hydro	0.3	1985	S. Gooding Main Cnl.	Lincoln	ID
Salmon 1	Fuel Oil	2.8	1967	Salmon	Lemhi	ID
Salmon 2	Fuel Oil	2.8	1967	Salmon	Lemhi	ID
Savage Rapids Diversion	Hydro	1.3	1955	Rogue R.	Jackson	OR
Schaffner	Hydro	0.5	1986	Sandy Cr., W. Fk.	Lemhi	ID
Seven Mile	Hydro	594.0	1979	Pend d'Oreille R.		BC
Sharrott Creek	Hydro	(0.1)		Sharrott Cr.	Ravalli	MT
Shingle Creek	Hydro	0.2	1984	Shingle Cr., S. Fk.	Idaho	ID
Short Mountain	Landfill Gas	3.2	1992	Short Mtn. Landfill	Lane	OR
Shoshone	Hydro	0.9	1982	Little Wood R.		ID
Shoshone Falls	Hydro	12.5	1907	Snake R.	Jerome	ID
Shuffleton 1	Fuel Oil	(35.1)	1930	Renton	King	WA
Shuffleton 2	Fuel Oil	(35.1)	1930	Renton	King	WA
Simplot Pocatello	Natural Gas	15.9	1986	Pocatello	Power	ID
Skagit County Resource Recovery	MSW	(2.5)	1988	Mt. Vernon	Skagit	WA
Skookumchuck	Hydro	1.0	1990	Skookumchuck R.		WA
Skyview Ranch Power	Hydro	(0.0)	1983	Euchre Cr.	Curry	OR
Slaughterhouse Gulch	Hydro	(0.1)	1983	Slaughterhouse Gulch	Twin Falls	ID
Slide Creek	Hydro	18.0	1951	N. Umpqua R.	Douglas	OR
Smith Creek	Hydro	0.1		Smith Cr.	Whatcom	WA

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Smith Creek	Hydro	37.8	1990	Smith Cr.	Boundary	ID
Smurfit Newsprint	Natural Gas	15.0		Oregon City	Clackamas	OR
Snake River Pottery	Hydro	0.1	1984	Snake R. Trib.		ID
Snedigar Ranch	Hydro	0.2	1985	Coulee Cr.	Twin Falls	ID
Snoqualmie Falls 1	Hydro	11.9	1898	Snoqualmie R.	King	WA
Snoqualmie Falls 2	Hydro	30.1	1910	Snoqualmie R.	King	WA
Snow Mountain Pine	Wood Residue	(8.0)		Hines	Harney	OR
Soda Creek 4	Hydro	0.5	1988	Soda Creek	Caribou	ID
Soda Creek 5	Hydro	0.4	1988	Soda Creek	Caribou	ID
Soda Point Reservoir	Hydro	14.0	1925	Bear R.		ID
Soda Springs Dam	Hydro	11.0	1952	N. Umpqua R.	Douglas	OR
South Dry Creek	Hydro	1.8	1985	Rock Cr., Clear Cr. Ditch	Carbon	MT
South Fork Tolt	Hydro	16.7	1995	S. Fk. Tolt R.	King	WA
South Slocan	Hydro			Kootenay R.		BC
South Whidbey	Fuel Oil	(27.0)	1972	Langley	Island	WA
South Willow Creek A	Hydro	0.0	1986	Potosi Cr.	Madison	MT
South Willow Creek B	Hydro	0.3	1980	South Willow Cr.	Madison	MT
SP Newsprint	Natural Gas	40.0		Newberg	Yamhill	OR
Spencer Lake Hydro	Hydro	0.0	1983	Unnamed Outlet to Spencer Lk.	San Juan	WA
Spillimacheen	Hydro	4.0	1955	Spillimacheen R.		BC
Spokane MSW	MSW	23.0	1991	Airway Heights	Spokane	WA
Spokane Wastewater	Wastewater Gas	0.3		Spokane	Spokane	WA
Spring Creek	Hydro	0.0	1991	Spring Cr.	Klickitat	WA
Springfield ICs	Fuel Oil	26.7	2001	Springfield	Lane	OR
St Regis	Wood Residue	4.0		Klickitat	Klickitat	WA
St. Anthony	Hydro	0.5	1915	Henrys Fk.		ID
Stateline Phase 1	Wind	200.0	2001	Vansycle Ridge	Walla Walla	WA
Stayton	Hydro	(0.6)		Santiam Wtr. Cntrl. Dist. Cnl.	Marion	OR

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Steam Plant No. 2	MSW	38.0	1989	Tacoma	Pierce	WA
Stevenson No. 1	Hydro	0.1	1979	Snake R. Trib.	Gooding	ID
Stevenson No. 2	Hydro	0.1	1980	Snake R. Trib.	Gooding	ID
Stone Container Corp.	Black Liquor	10.9	1990	Missoula	Missoula	MT
Stone Creek	Hydro	12.0	1993	Clackamas R., Oak Grove Fk.	Clackamas	OR
Strawberry	Hydro	1.5	1951	Strawberry Cr.	Lincoln	WY
Strawberry Creek	Hydro	0.3	1987	Strawberry Cr.	Park	MT
Sumas Energy	Natural Gas	123.0	1993	Sumas	Whatcom	WA
Summer Falls	Hydro	92.0	1984	Main Cnl.		WA
Summit 1	Fuel Oil	(3.0)	1967	Government Camp	Clackamas	OR
Summit 2	Fuel Oil	(3.0)	1967	Government Camp	Clackamas	OR
Sunshine	Hydro	0.1	1987	Lake Cr.	Lemhi	ID
Swan Falls	Hydro	25.0	1910	Snake R.	Ada	ID
Swift 1	Hydro	240.0	1958	Lewis R.	Skamania	WA
Swift 2	Hydro	70.0	1958	Lewis R.	Cowlitz	WA
Swift Lower	Hydro	0.8		Swift Cr.	Lincoln	WY
Swift Upper	Hydro	0.8		Swift Cr.	Lincoln	WY
Sygitowicz Creek	Hydro	0.5	1986	Sygitowicz Cr.	Whatcom	WA
T.W. Sullivan	Hydro	15.3	1985	Willamette R.	Clackamas	OR
Tacoma Landfill	Landfill Gas	1.9	1998	Fircrest	Pierce	WA
Tacoma Power ICs	Fuel Oil	48.0	2001	Tacoma (Northeast Sub)	Pierce	WA
Telford	Hydro	0.2	1984	Bell Mountain Cr.	Butte	ID
Tenaska Washington I	Natural Gas	245.0	1994	Ferndale	Whatcom	WA
The Dalles	Hydro	1807.0	1957	Columbia R.		OR/WA
The Dalles North Fishway	Hydro	4.9	1991	Columbia R.	Klickitat	WA
Thompson Falls	Hydro	50.0	1915	Clark Fork R.		MT
Thompson's Mills	Hydro	0.1	1986	Calapooia R.	Linn	OR
Thousand Springs	Hydro	8.8	1912	Snake R. (Off-stream)	Gooding	ID

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Tillamook Lumber	Wood Residue	12.5	1978	Tillamook	Tillamook	OR
Toketee Falls Dam	Hydro	42.6	1950	N. Umpqua R.	Douglas	OR
Trail Bridge	Hydro	10.0	1963	McKenzie R.		OR
Trinity	Hydro	0.2	1923	Phelps Cr.		WA
Trojan	Uranium	(1216.0)	1975	Rainier	Columbia	OR
Troy	Wood Residue	2.1		Troy	Lincoln	MT
Tuttle Ranch	Hydro	1.1	1983	Big Wood R.	Gooding	ID
Twin Falls	Hydro	20.0	1990	Snoqualamie R., S. Fk.		WA
Twin Falls A & B	Hydro	52.7	1935	Snake R.	Twin Falls	ID
Twin Reservoirs	Hydro	2.1	1988	Mill Cr.		WA
University of Oregon	Wood Residue	5.5		Eugene	Lane	OR
University of Washington	Natural Gas	5.0		Seattle	King	WA
Upper Baker	Hydro	90.7	1959	Baker R.		WA
Upper Bonnington	Hydro			Kootenay R.		BC
Upper Falls	Hydro	10.0	1922	Spokane R.		WA
Upper Indian Creek	Hydro	(0.1)	1984	Indian Cr.	Union	OR
Upper Little Sheep Creek	Hydro	(4.3)	1984	Wallowa Valley Imp. Dist. Cnl.	Wallowa	OR
Upper Malad	Hydro	7.2	1948	Big Wood R.	Gooding	ID
Upper Pine Creek	Hydro	0.0	1985	Pine Cr.	Lincoln	MT
Upper Salmon 1 & 2 (A)	Hydro	18.0	1937	Snake R.	Twin Falls	ID
Upper Salmon 3 & 4 (B)	Hydro	16.6	1947	Snake R.	Twin Falls	ID
Upriver Dam A & B	Hydro	14.6	1983	Spokane R.		WA
Vaagen Brothers Lumber	Wood Residue	4.0	1980	Colville	Stevens	WA
Valmy 1	Coal	254.0	1981	Valmy	Humboldt	NV
Valmy 2	Coal	267.0	1985	Valmy	Humboldt	NV
Vansycle Wind Energy Project	Wind	24.9	1998	Helix	Umatilla	OR
W. I. Forest Products	Wood Residue	2.4		Peshastin	Chelan	WA
Wallowa Falls	Hydro	1.1	1921	Wallowa Cr., E. Fk.	Wallowa	OR
Walter Hardman (Coursier)	Hydro	8.0		Cranberry Cr.		BC

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Walterville	Hydro	8.0	1911	McKenzie R.	Lane	OR
Wanapum	Hydro	900.0	1963	Columbia R.	Grant	WA
Waneta	Hydro	386.0	1954	Pend d'Oreille R.		BC
Wapato Drop 2	Hydro	2.0	1942	Yakima R. (Off-stream)	Yakima	WA
Wapato Drop 3	Hydro	1.4	1932	Yakima R. (Off-stream)	Yakima	WA
Warm Springs Forest Products	Wood Residue	9.0	1960	Warm Springs	Wasco	OR
Warren	Hydro	0.0	1953	Slaughter Cr.	Idaho	ID
Washington State University	Coal	2.5		Pullman	Whitman	WA
Water Street	Hydro	0.2	1985	Stayton Power Cnl.	Marion	OR
Weeks Falls	Hydro	5.3	1985	Snoqualamie R., S. Fk.	King	WA
Wells	Hydro	774.3	1967	Columbia R.	Douglas	WA
West Boise Wastewater	Wastewater Gas	0.2	1991	Boise	Ada	ID
West Linn	Hydro	(3.6)		Willamette R.	Clackamas	OR
West Linn Paper Co.	Natural Gas			West Linn	Clackamas	OR
West Point Treatment Plant 1-3	Wastewater Gas	3.9	1982	Seattle	King	WA
West Side	Hydro	0.6	1908	Klamath R.	Klamath	OR
Weyerhaeuser (Everett)	Black Liquor	(12.5)		Everett	Snohomish	WA
Weyerhaeuser (Longview) 2	Black Liquor	5.0	1948	Longview	Cowlitz	WA
Weyerhaeuser (Longview) 4	Black Liquor	15.0	1954	Longview	Cowlitz	WA
Weyerhaeuser (Longview) 5	Coal	31.4	1976	Longview	Cowlitz	WA
Weyerhaeuser (Cosmopolis) 1	Fuel Oil	7.5	1957	Cosmopolis	Grays Harbor	WA
Weyerhaeuser (Cosmopolis) 2	Fuel Oil	7.5	1957	Cosmopolis	Grays Harbor	WA
Weyerhaeuser - North Bend	Wood Residue	(4.0)		Cottage Grove	Lane	OR
Weyerhaeuser - Cottage Grove	Wood Residue	4.0		Cottage Grove	Lane	OR
Weyerhaeuser (Springfield) 1	Black Liquor	7.5		Springfield	Lane	OR
Weyerhaeuser (Springfield) 2	Black Liquor	5.0	1949	Springfield	Lane	OR
Weyerhaeuser (Springfield) 3	Black Liquor	12.5	1953	Springfield	Lane	OR
Weyerhaeuser (Springfield) 4 (EWEB/WEYCO)	Black Liquor	51.2	1975	Springfield	Lane	OR
Whatcom Co. MSW	MSW	2.0	1986	Ferndale	Whatcom	WA

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	SITE	COUNTY	STATE
Whatshan	Hydro	54.0	1972	Whatshan R.		BC
White Ranch	Hydro	0.3	1986	Mud Cr.	Twin Falls	ID
White River	Hydro	70.0	1912	Lake Tapps Flume	Pierce	WA
White Water Ranch A	Hydro	0.0	1985	Stoddard Cr.	Gooding	ID
White Water Ranch C	Hydro	0.1	1985	Stoddard Cr.	Gooding	ID
Whitefish	Hydro	0.2	1985	Haskill Cr., Trib.	Flathead	MT
Willamette Industries - Albany	Natural Gas	51.0	1995	Albany	Linn	OR
Willamette Industries - Dallas	Wood Residue	4.5		Dallas	Polk	OR
Willamette Industries - Foster	Wood Residue	4.5		Foster	Linn	OR
Willamette Industries - Sweet Home	Wood Residue	(6.0)		Sweet Home	Linn	OR
Willamette Steam 2 & 3	Natural Gas	25.0	1960	Eugene	Lane	OR
Willow Lake Wastewater	Wastewater Gas	0.8		Salem	Marion	OR
Wilson Lake	Hydro	8.4	1993	N. Side Main Cnl.	Jerome	ID
Winchester	Hydro	(1.3)	1983	N. Umqua R.		OR
Wisconsin-Noble	Hydro	0.5	1989	Noble Fk.	Madison	MT
Wolf Creek	Hydro	0.1	1987	Wolf Cr. (Off-stream)	Washington	OR
Wood River	Natural Gas	(50.0)	1974	Hailey	Blaine	ID
Woods Creek	Hydro	0.7	1982	Woods Cr., E. Fk.	Snohomish	WA
WTD Industries	Wood Residue	(6.0)		Chemult	Klamath	OR
Wynoochee	Hydro	12.8	1993	Wynooche R.	Grays Harbor	WA
Y-8 Hydroelectric Project (Northside Canal)	Hydro	0.1	1983	N. Side Main "Y" Cnl.	Gooding	ID
Yale	Hydro	134.0	1953	Lewis R.	Clark	WA
Yellowtail	Hydro	250.0	1966	Bighorn R.	Big Horn	MT
Yelm	Hydro	12.0	1930	Nisqually R.	Thurston	WA
Zena Creek Ranch	Hydro	0.0	1952	Zena Cr.	Valley	ID

Table B: PROPOSED POWER PLANTS IN THE PACIFIC NORTHWEST (April 2001)

<i>PROJECT</i>	<i>PRIMARY RESOURCE</i>	<i>INSTALLED CAPACITY</i>	<i>SERVICE DATE</i>	<i>STATE</i>
IDA WEST	Natural Gas	250	Jan-04	ID
KOOTENAI	Natural Gas	1300	Jun-05	ID
RATHDRUM I	Natural Gas	265	Aug-01	ID
RATHDRUM II	Natural Gas	500	Dec-04	ID
RATHDRUM III	Natural Gas	500	Dec-04	ID
RATHDRUM IV	Natural Gas	310	Dec-04	ID
BLK FEET (MERCHANT)	Natural Gas	160		MT
SILVER BOW	Natural Gas	400	Jun-03	MT
COBERG	Natural Gas	265	Aug-03	OR
COYOTE SPRINGS II	Natural Gas	260	Jun-02	OR
HERMISTON POWER PROJECT	Natural Gas	536	Sep-02	OR
KLAMATH	Natural Gas	200-250	May-01	OR
KLAMATH COGEN PROJECT	Natural Gas	500	May-01	OR
KLAMATH COGEN PROJECT	Natural Gas	50	Mar-02	OR
KLAMATH COUNTY	Natural Gas	450	Jun-04	OR
MADRAS, (at N. Grisely)	Natural Gas	1100	Jul-04	OR
MCNARY	Natural Gas	500	Jun-05	OR
UMATILLA @ McNary	Natural Gas	1000	Sep-03	OR
PORT WESTWARD	Natural Gas	330-660	Jan-04	OR
ST HELENS (Boise Cascade)	Natural Gas	170	Oct-01	OR
CLATSKANIE	Natural Gas	520	Nov-03	OR
TROUTDALE	Natural Gas	1100	Jun-04	OR
UMATILLA GENERATING PROJECT	Natural Gas	581	Dec-03	OR
WARM SPRINGS	Natural Gas	500		OR
ALCOA	Natural Gas	100	Jan-01	WA
ALCOA	Natural Gas	600	Jun-05	WA
CHERRY POINT	Natural Gas	700-1000	Feb-04	WA
CENTRALIA TRANSALTA	Natural Gas	248	Jun-01	WA
CHEHALIS GENERATING PROJECT	Natural Gas	660	Nov-03	WA
EVERETT DELTA I & II	Natural Gas	500	Sep-02	WA

PROJECT	PRIMARY RESOURCE	INSTALLED CAPACITY	SERVICE DATE	STATE
INTALCO FERNDALE	Natural Gas	500	Jun-05	WA
FREDRICKSON II	Natural Gas	249	Jan-03	WA
GOLDENDALE (GNA)	Natural Gas	180	Feb-02	WA
GOLDENDALE	Natural Gas	247	Jul-02	WA
GRANT COUNTY	Natural Gas	1300	Jun-05	WA
LONGVIEW GENERATION	Natural Gas	245	Jul-03	WA
LONGVIEW MINT FARM	Natural Gas	245	Jul-03	WA
LONGVIEW MINT FARM #2	Natural Gas	100-200	Feb-02	WA
MT VERNON	Natural Gas	600	Jun-05	WA
MERCER RANCH	Natural Gas	760	Oct-04	WA
NEWPORT GENERATION (Wallula)	Natural Gas	1300	Jul-04	WA
NEWPORT GENERATION (Intalco)	Natural Gas	1300	Jan-05	WA
NORDIC BARGE	Natural Gas	100	Aug-01	WA
SATSOP	Natural Gas	630	Jan-03	WA
SATSOP II & III	Natural Gas	1200	Jan-05	WA
STARBUCK	Natural Gas	1200	Oct-03	WA
SUMAS II	Natural Gas	660	Jan-02	WA

Appendix F

PACIFIC COAST SALMON - ENCYCLOPEDIA OF GLOBAL ENVIRONMENTAL CHANGE

Article by
David Welch¹

*The eight species of Pacific salmon (genus *Oncorhynchus*) form one of the most valuable fisheries resources in the world, and have high value to the peoples of the Pacific Rim as an indicator of the health of the natural ecosystem. Pacific salmon are particularly vulnerable to climate change because their complex life histories involve extended periods of life in both the freshwater and marine ecosystem, exposing them to climate disruptions in both habitats.*

Climatic changes which disrupt the life cycle of Pacific salmon and reduce the chance of successfully breeding are especially serious because in most species adults die after breeding. This makes the persistence of populations dependent on successful completion of the life cycle to a much greater degree than in animals where adults have the opportunity to reproduce more than once. As a result, once sexual maturation starts and salmon begin their long migration back through the sea and up the rivers, events that disrupt breeding success leave no chance for the animals to leave and return to breed the next year. In addition, substantial differences in behavior between populations, such as in the timing of egg development, hatching, and spawning, as well as strong fidelity to the spawning grounds are believed to be inherited and the result of strong selection to their local environment. Such characteristics may be particularly vulnerable to disruption by climate change.

All species of Pacific salmon begin life as fertilized eggs laid in nests dug out of the gravel or cobble bottoms of lakes and rivers. The embryos then develop over the winter before hatching. Following hatching, the fry emerge from the gravel in the spring. In pink and chum salmon the fry quickly leave freshwater and enter the ocean. In the remainder of the species the young salmon make much more extensive use of the freshwater habitat (rivers and lakes) for one or more years before migrating to the sea.

After entering the ocean, a period of time may be spent in estuaries or near-shore habitats where adaptation to the marine environment is completed and rapid growth begins. Most salmon then begin a rapid and highly directed northwards migration along the narrow continental shelf, where most eventually leave the coastal zone and remain in the open ocean for a period of several years. As sexual maturation begins, salmon begin directed homing migrations over long distances in both the ocean and freshwater. Much less is known of the marine phase of the life history than the freshwater phase, but evidence

¹ This article, prepared by David Welch, is in press.

accumulated over the past decade suggests that changes in ocean survival have been at least as serious as changes in freshwater survival.

Most growth and approximately half of the mortality occurs in the ocean. As a result, climatic disruptions that happen at any point in the life history can result in severe impacts on survival rates. Freshwater migrations are affected by changes in water temperature, and rate and timing of river flow. Climate change projections generally indicate that winters will be warmer and wetter in future, while summers will be warmer and perhaps drier. With more precipitation falling as rain rather than snow, the spring run-off is expected to occur earlier and be more intense in future, while river flows in summer will probably be warmer and less rapid, providing less moderation of summer temperature extremes. Young fish migrating to sea may be affected by changed timing of river flows, or mismatch with peaks in ocean production. Adult salmon returning to breed may experience strong river flows and high water temperatures that drain their energy reserves to the point that they are unable to reach the spawning grounds. The unusual warming experienced in the 1990s saw much higher mortality of adult salmon returning to many parts of British Columbia's Fraser River. This was apparently a result of high temperature and stream flows increasing the energy demands on migrating adults, while reduced growth at sea resulted in them returning at smaller sizes and with reduced energy reserves than in the past.

In the North Pacific elevated temperatures may ultimately reduce salmon populations by limiting their ocean distribution. All species of Pacific salmon sharply avoid warmer temperatures at sea, effectively limiting them to a substantially smaller area of the open Pacific Ocean that they could otherwise occupy. Global warming models project temperature increases that could exclude several species of salmon from the Pacific Ocean within 50 years at expected rates of greenhouse gas increase. Increasing temperature may also change the structure of the ocean through warming of the surface layer. Warming will increase the temperature contrast with the deep ocean, and may reduce mixing and restrict the input of essential nutrients necessary to fuel the food chain. Such an effect has already been observed in the 1990s, with the thinning of the surface layer resulting in a switch to a nitrate-depleted ecosystem in the Gulf of Alaska for the first time on record.

Several lines of evidence suggest that salmon are strongly adapted to the climate of the relatively recent past. As concentrations of greenhouse gases increase to levels not seen for hundreds of thousands of years, current adaptations may not serve salmon as well in the future. Many critical aspects of the life cycle are completed during brief time periods (for example, timing of egg hatch, ocean entry for young salmon, breeding of adults). It is thought that evolutionary forces strongly selected for individuals with specific characteristics appropriate for each population, and that animals deviating from these characteristics did not survive to pass on different behaviors.

Climate change is unlikely to be favorable for most salmon populations, particularly at the southern end of their range where human populations are high and the value placed on persistence of salmon is greatest. Climate disruption is likely to exacerbate conflicts

with other resource users. Water draw-down to support agriculture and more restrictive land-use regulations on forestry or urban development to protect salmon brings these competing resource sectors into sharp conflict as Pacific salmon populations become less productive. Hydro-electric dams—one of the few energy sources that do not involve generation of greenhouse gases—have also been blamed for affecting salmon populations by changing the natural flow of rivers and affecting the survival of both young and mature salmon migrating past the dams. In addition, many fisheries have either explicit legal entitlements (such as treaty rights granted native fishermen) or implicit claims to the salmon resource based on past access.

Despite these concerns, changes in climate will not be uniformly bad for Pacific salmon. Continued warming, for example, will moderate the harsher climates in northern regions, likely improving conditions for salmon. A few sexually mature Pacific salmon have been reported from the Canadian high arctic in recent years, suggesting that the range of salmon is expanding to the north as climate has warmed. The productivity of many Alaskan salmon populations has also increased over the last few decades as salmon populations in southern regions have fallen. However, it is unlikely that the increased economic gain from the salmon catches in northern regions has outweighed the economic costs from trying to maintain salmon populations in southern regions. At least in North America, recent climate warming has had decidedly mixed effects, and the increasing disparity has resulted in bitter argument over salmon conservation.

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Fish and Wildlife Implementation Plan DEIS
Appendix F: Pacific Coast Salmon –
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Appendix G

HATCHERIES OF THE PACIFIC NORTHWEST (2/2001)

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Abernathy Salmon Culture Tech Center	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Elochoman
Alder Creek Pond	Unknown / Unspecified	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
Alsea Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq		No	OR	N Oregon Coast
American Falls Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Upper Snake
Arlington	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Ashton Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Upper Snake
Aumsville Ponds	Anadromous	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Willamette
Baker Lake Spawn Beach	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Bandon Fish Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	S Oregon Coast
Barnaby Slough Pond	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Barnhart Acclimation/ Release Site	Anadromous	Umatilla Confederated Tribes	Major	No	OR	Umatilla
Beaver Creek Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Elochoman
Beaver Slough Rearing Ponds	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
Bellingham	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Big Beef Creek Hatchery / Field Station	Anadromous	National Marine Fisheries Service - Seattle Office	Minor	No	WA	Puget Sound Basin

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Big Canyon Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Big Canyon Satellite Facility	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Grande Ronde
Big Creek Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Columbia Estuary /Ocean
Big White Salmon Rearing Pond	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	White Salmon
Bingham Creek Hatchery	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Bogachiel	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Bonifer Acclimation Ponds	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Bonneville Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Lower Columbia
Butte Falls Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	S Oregon Coast
Cabinet Gorge Hatchery	Resident Fish	Idaho Department Of Fish & Game	Major	Yes	ID	Clark Fork
Captain John Rapids Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Snake Hells Canyon
Carson National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Wind
Cascade Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Columbia Gorge
Catherine Creek Acclimation Site	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Grande Ronde
Catherine Creek Trap	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Grande Ronde
Cedar Creek Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq		No	OR	N Oregon Coast
Cedar Flats Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Cedar River	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Chambers Creek	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Chandler Juvenile Facility	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Cherrylane Tribal Hatchery	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Chewach Trap & Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Methow
Chiwawa Rearing Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Wenatchee
Clackamas Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Clark Flat Acclimation Site	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Clark Fork Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Clark Fork
Clatsop (Cedc) Ponds	Anadromous	Clatsop Economic Development Committee	Minor	Yes	OR	Youngs
Clearwater Hatchery	Mixed Anadromous / Resident Fish	Idaho Department Of Fish & Game	Minor	Yes	ID	Clearwater
Coeur d'Alene Trout Hatchery	Resident Fish	Coeur d'Alene Tribe Of Idaho	Major	Yes	ID	Coeur d'Alene
Cole M. Rivers Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq		No	OR	S Oregon Coast
Columbia Basin Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Crab Creek
Colville Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Upper Columbia
Colville Tribal Hatchery	Resident Fish	Colville Confederated Tribes	Major	Yes	WA	Upper Columbia
Corporation Direct Release Site	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Cottonwood Satellite Facility	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Grande Ronde
Coulter Creek	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Coweeman Ponds	Unknown / Unspecified	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
Cowlitz Salmon Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Cowlitz
Cowlitz Trout Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
Creston National Fish Hatchery	Resident Fish	Us Fish And Wildlife Service - Portland Region	Major	Yes	MT	Flathead
Crooked River Satellite Facility	Anadromous	Idaho Department Of Fish & Game	Major	Yes	ID	Clearwater
Curl Lake Satellite Facility	Anadromous	Washington Department Of Fish & Wildlife	Major	Yes	WA	Lower Snake
Dayton Pond Satellite Facility	Anadromous	Washington Department Of Fish & Wildlife	Major	Yes	WA	Walla Walla
Dexter Pond	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Dryden Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Wenatchee
Dungeness	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Dworshak National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	ID	Clearwater
Eagle Creek National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	OR	Willamette
Eagle Fish Health Laboratory	Anadromous	Idaho Department Of Fish & Game	Major	Yes	ID	Boise
East Fork Salmon River Satellite Facility	Anadromous	Idaho Department Of Fish & Game	Major	Yes	ID	Salmon
Eastbank Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Upper Mid-Columbia

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Easton Acclimation Site	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Eells Spring	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Elk River Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	S Oregon Coast
Elochoman Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Elochoman
Elwha Channel	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Entiat National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Entiat
Fall Creek Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	N Oregon Coast
Fall River Hatchery	Resident Fish	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Deschutes
Fallert Creek Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Kalama
Flathead Lake Salmon Hatchery	Resident Fish	Montana Department Of Fish & Wildlife - Helena		Yes	MT	Flathead
Ford Trout Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Spokane Lower
Forks Creek Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Fox Island Pens	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Fred Grey Pond	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Garrison	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
George Adams Hatchery	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Gnat Creek Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Columbia Estuary /Ocean

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Gobar Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Kalama
Goldendale Trout Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Klickitat
Grace Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Upper Snake
Grays River Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Grays
Green River Hatchery	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Hagerman Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Middle Snake
Hagerman National Fish Hatchery	Mixed Anadromous / Resident Fish	Us Fish And Wildlife Service - Portland Region	Minor	Yes	ID	Middle Snake
Hayden Creek Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Salmon
Hayspur Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Upper Snake
Herman Creek Pond	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Columbia Gorge
Hoodsport	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Humptulips	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Hungry Horse Hatchery	Resident Fish	Montana Department Of Fish & Wildlife - Helena		Yes	MT	Flathead
Hupp Spring	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Hurd Creek	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Icy Creek Pond	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Imeqes C Mem Ini Kem Juv Acclim Pond	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Imnaha Satellite Facility	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Imnaha
Irrigon Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Lower Mid-Columbia
Issaquah	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Jack Creek Acclimation Site	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Jocko River Trout Hatchery	Resident Fish	Montana Department Of Fish & Wildlife - Helena		Yes	MT	Flathead
Johnson Creek Hatchery	Anadromous	Nez Perce Tribe	Major	Yes	ID	Salmon
K Basin - Hanford	Anadromous	Yakama Nation	Major	Yes	WA	Lower Mid-Columbia
Kalama Falls Salmon Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Kalama
Kalispel Tribal Hatchery	Resident Fish	Kalispel Tribe Of Indians	Major	Yes	WA	Pend Oreille
Kendall Creek	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Klamath Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq		No	OR	Moyie
Klaskanine Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Columbia Estuary /Ocean
Klickitat Salmon Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Klickitat
Klickitat Tribal Hatchery	Anadromous	Yakama Nation	Major	Yes	WA	Klickitat
Kooskia National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	ID	Clearwater
Kootenai Tribal Hatchery	Resident Fish	Kootenai Tribe Of Idaho	Major	Yes	ID	Kootenai
Lake Aberdeen	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Lake Wenatchee Net Pens	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Wenatchee
Lake Whatcom	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Lakewood	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Leaburg Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Leavenworth National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Wenatchee
Lewis River Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Lewis
Little Sheep Creek Satellite Facility	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Imnaha
Little White Salmon National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Little White Salmon
Lookingglass Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Grande Ronde
Lostine Acclimation Site	Anadromous	Nez Perce Tribe	Major	Yes	OR	Grande Ronde
Lower Kalama Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Kalama
Luke's Gulch Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Lyons Ferry Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Major	Yes	WA	Lower Snake
Mackay Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Upper Snake
Magic Valley Hatchery	Mixed Anadromous / Resident Fish	Idaho Department Of Fish & Game	Minor	Yes	ID	Middle Snake
Makah National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region		No	WA	Washington Coast
Marblemount Hatchery	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Marion Drain Fish Hatchery	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Marion Forks Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Mc Call Hatchery	Mixed Anadromous / Resident Fish	Idaho Department Of Fish & Game	Major	Yes	ID	Payette
Mcallister	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Mckenzie Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Mckernan	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Meadow Creek Adult Trapping Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Merwin Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Lewis
Merwin Net Pens	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Lewis
Methow Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Methow
Methow Salmon Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Methow
Minter Creek Hatchery	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Minthorn Springs Acclimation Pond	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Minto Pond	Anadromous	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Willamette
Mission Juvenile Acclimation Pond	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Mossyrock Trout Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
Mullen Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Coeur d'Alene

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Murray Springs Trout Hatchery	Resident Fish	Montana Department Of Fish & Wildlife - Helena		Yes	MT	Kootenai
Naches Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Yakima
Nampa Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Middle Snake
Naselle	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Nehalem Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	N Oregon Coast
Nelson Springs Raceway	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Yakima
Nemah	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Newsome Creek Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Nez Perce Tribal Hatchery	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Niagara Springs Hatchery	Anadromous	Idaho Department Of Fish & Game	Minor	Yes	ID	Middle Snake
Niles Springs Ponds	Anadromous	Yakama Nation	Minor	Yes	WA	Yakima
Nisqually Fish Hatchery At Clear Creek	Anadromous	Us Fish And Wildlife Service - Portland Region		No	WA	Puget Sound Basin
North Fork Clackamas Reservoir Net Pens	Anadromous	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Willamette
North Lapwai Valley Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
North Toutle Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
NW Fisheries Science Cntr [Montlake Cr Fish Farm]	Anadromous	National Marine Fisheries Service - Seattle Office		No	WA	Puget Sound Basin
Oak Springs Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Deschutes

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Omak Trout Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Okanogan
Oxbow Hatchery (Snake)	Anadromous	Idaho Department Of Fish & Game		Yes	OR	Middle Snake
Oxbow Springs Hatchery (Columbia)	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Columbia Gorge
Pahsimeroi Hatchery	Anadromous	Idaho Department Of Fish & Game	Minor	Yes	ID	Salmon
Parkdale Fish Facility	Anadromous	Warm Springs Tribes	Major	Yes	OR	Hood
Pelton Dam Fish Ladder (Hatchery)	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Deschutes
Pendleton Ponds Satellite Facility	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Pittsburg Landing Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Snake Hells Canyon
Powell Satellite Facility	Anadromous	Idaho Department Of Fish & Game	Major	Yes	ID	Clearwater
Powerdale Fish Trapping Facility	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Hood
Priest Rapids Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Lower Mid-Columbia
Prosser Dvr Dam / Chandler Canal Fish Trap	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Prosser Dvr Dam Acclimation Ponds	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Puyallup	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Quilcene National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region		Yes	WA	Washington Coast
Quinalt National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region		No	WA	Washington Coast
Rapid River Hatchery	Anadromous	Idaho Department Of Fish & Game	Minor	Yes	ID	Salmon

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Red River Satellite Facility	Anadromous	Idaho Department Of Fish & Game	Major	Yes	ID	Clearwater
Reiter Ponds	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Ringold Springs Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Lower Mid-Columbia
Roaring River Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Rock Creek Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq		No	OR	S Oregon Coast
Rock Creek Pens (32 Mi Abv Jd Dam)	Anadromous	Us Fish And Wildlife Service - Portland Region		Yes	WA	Lower Mid-Columbia
Rocky Reach Hatchery	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Upper Mid-Columbia
Round Butte Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Deschutes
Salmon River Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	N Oregon Coast
Samish	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Sandpoint Hatchery	Resident Fish	Idaho Department Of Fish & Game		Yes	ID	Pend Oreille
Sandy Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Sandy
Satsop Springs	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Sawtooth Hatchery	Mixed Anadromous / Resident Fish	Idaho Department Of Fish & Game	Minor	Yes	ID	Salmon
Shale Creek	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Sherman Creek Hatchery	Resident Fish	Washington Department Of Fish & Wildlife	Major	Yes	WA	Upper Columbia
Similkameen Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Okanogan

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Simpson Hatchery	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Skamania Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Lower Columbia
Skookumchuck	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Social Security Pond/ Net Pens	Anadromous	Us Fish And Wildlife Service - Portland Region		Yes	OR	Lower Mid-Columbia
Sol Duc	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Washington Coast
Soos Creek	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
South Fork Salmon River Satellite Facility	Anadromous	Idaho Department Of Fish & Game	Major	Yes	ID	Salmon
South Santiam Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
South Toutle Trap	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Cowlitz
Speelyai Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Lewis
Spokane Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Spokane Lower
Spokane Tribal Hatchery	Resident Fish	Spokane Tribe Of Indians	Major	Yes	WA	Spokane Lower
Spring Creek National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	White Salmon
Stayton Rearing Pond	Anadromous	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Willamette
Sweetwater Springs Tribal Hatchery	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater
Thornhollow Acclimation Pond	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Tokul	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Toutle Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Cowlitz
Trask River Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq		No	OR	N Oregon Coast
Trojan Rearing Pond	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Lower Columbia
Tucannon Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Major	Yes	WA	Tucannon
Tucker Creek / Vanderveldt Ponds	Anadromous	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Youngs
Tumwater Falls	Anadromous	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Turtle Rock Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Upper Mid-Columbia
Twisp Trap & Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Methow
U Of Washington Teaching & Research Hatchery	Anadromous	University Of Washington		No	WA	Puget Sound Basin
Umatilla Hatchery	Anadromous	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Lower Mid-Columbia
Umatilla River / ODFW Site Rm 56.2	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Umatilla
Upper Grande Ronde Acclimation Site	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Grande Ronde
Upper Grande Ronde Trap	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Grande Ronde
Upper Snake River Tribal Hatchery	Resident Fish	Shoshone-Bannock Tribes	Major	Yes	ID	Upper Snake
Vancouver Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Lower Columbia
Voights Creek	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Wahkeena Pond	Anadromous	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Lower Columbia

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Walla Walla Hatchery	Anadromous	Umatilla Confederated Tribes	Major	Yes	WA	Walla Walla
Walla Walla River, South Fork Satellite	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Walla Walla
Wallace River	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Wallowa Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Major	Yes	OR	Grande Ronde
Wapato Canal Pen Rearing	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Wapato Dam Acclimation Pond	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Wapatox Dvr Dam Smolt Trap	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Warm Springs National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	OR	Deschutes
Washoe Park Trout Hatchery	Resident Fish	Montana Department Of Fish & Wildlife - Helena		Yes	MT	Clark Fork
Washougal Hatchery	Anadromous	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Washougal
Wells Hatchery	Mixed Anadromous / Resident Fish	Washington Department Of Fish & Wildlife	Minor	Yes	WA	Upper Mid-Columbia
West Fork Acclimation Site (Dry Run Bridge)	Anadromous	Umatilla Confederated Tribes	Major	Yes	OR	Hood
Weyco Pond	Anadromous	Washington Department Of Fish & Wildlife		Yes	WA	Columbia Estuary /Ocean
Whitehorse Pond	Unknown / Unspecified	Washington Department Of Fish & Wildlife		No	WA	Puget Sound Basin
Willamette [Oakridge] Hatchery	Mixed Anadromous / Resident Fish	Oregon Department Of Fish & Wildlife- Hq	Minor	Yes	OR	Willamette
Willard National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Little White Salmon
Winthrop National Fish Hatchery	Anadromous	Us Fish And Wildlife Service - Portland Region	Minor	Yes	WA	Methow

Hatchery	Type	Agency	BPA Funds	Columbia Basin	State	Subbasin
Wizard Falls Hatchery	Resident Fish	Oregon Department Of Fish & Wildlife- Hq		Yes	OR	Deschutes
Yakima Hatchery	Anadromous	Yakama Nation	Major	Yes	WA	Yakima
Yakima Trout Hatchery	Resident Fish	Washington Department Of Fish & Wildlife		Yes	WA	Yakima
Yoosa / Camp Creek Acclimation Facility	Anadromous	Nez Perce Tribe	Major	Yes	ID	Clearwater

Sources Web Pages of IDFG, WDFW, ODFW, MDFW, plus data from the BPA historic files, StreamNet, etc. Jan 2001.

Complex: refers primarily to groupings of Washington state hatcheries.

BPA Funds: *Major* = substantial support from BPA, *Minor* = some support for research, production, etc.

Appendix H

BPA FISH AND WILDLIFE PROJECTS 1978-2000 (UPDATED 2/2001)

Subbasin	Program	Title
Columbia Estuary /Ocean	Anadromous Fish	Columbia Estuary Migrational Characteristics
Columbia Estuary /Ocean	Anadromous Fish	Contributions To The Columbia River Estuary Atlas
Columbia Estuary /Ocean	Anadromous Fish	Juvenile Salmon In The Columbia Estuary
Columbia Estuary /Ocean	Anadromous Fish	DNA Variation In Coho - Lower Columbia
Columbia Estuary /Ocean	Anadromous Fish	Columbia River/Estuary Carrying Capacity Study
Columbia Estuary /Ocean	Anadromous Fish	Columbia River Terminal Fisheries Research - ODFW
Columbia Estuary /Ocean	Anadromous Fish	Columbia Select Area Fishery Evaluation - Cedc
Columbia Estuary /Ocean	Anadromous Fish	Columbia Select Area Fishery Evaluation - WDFW
Columbia Estuary /Ocean	Anadromous Fish	Avian Predation Technical Advisor
Columbia Estuary /Ocean	Anadromous Fish	Self Contained Sound System
Columbia Estuary /Ocean	Anadromous Fish	Consultant, Caspian Tern Survey, Alaska
Columbia Estuary /Ocean	Anadromous Fish	Marine Fish Predation On Juvenile Salmonids
Columbia Estuary /Ocean	Anadromous Fish	Assess Impacts Of Hydro Development On The Estuary
Columbia Estuary /Ocean	Anadromous Fish	Ocean Survival Of Salmonids
Youngs	Anadromous Fish	Young's Bay Terminal Fishery
Lewis	Anadromous Fish	Evaluate Lamprey Habitat/Population In Cedar Creek
Lower Columbia	Anadromous Fish	Avian Predation On Juvenile Salmonids
Lower Columbia	Anadromous Fish	Bonneville Captive Brood Facility Construction
Lower Columbia	Anadromous Fish	Salmon Spawning Below Lower Columbia Dams-ODFW
Lower Columbia	Anadromous Fish	Salmon Spawning Below Lower Columbia Dams-WDFW
Lower Columbia	Anadromous Fish	Salmon Spawning Below Lower Columbia Dams-USFWS
Lower Columbia	Anadromous Fish	Salmon Spawning Below Lower Columbia Dams-Doe-Pnrl
Lower Columbia	Anadromous Fish	Salmon Spawning Below Lower Columbia Dams-USGS
Lower Columbia	Wildlife	Vancouver Lowlands Wildlife Tract
Lower Columbia	Wildlife	Steigerwald / Burlington Northern
Sandy	Anadromous Fish	Video Of Wild Spring Chinook Spawning - Mt Hood NF
Sandy	Anadromous Fish	Sandy River Basin BPA Right-Of-Way Study
Sandy	Wildlife	Sandy River Wetlands Restoration & Evaluation
Willamette	Anadromous Fish	Fish / Wash Creeks Habitat Enhancement
Willamette	Anadromous Fish	Fish Cr, Lake Branch & Collawash Habitat Work
Willamette	Anadromous Fish	Willamette Spring Chinook Study
Willamette	Anadromous Fish	Little Fall Creek Passage Improvement And O & M

Subbasin	Program	Title
Willamette	Anadromous Fish	Provide O&M For Little Fall Creek Passage Project
Willamette	Anadromous Fish	Little Falls Creek Ladder Repair
Willamette	Anadromous Fish	Eagle Creek Hydro Project (Maintenance)
Willamette	Anadromous Fish	Construct Corvallis Fish Disease Laboratory
Willamette	Anadromous Fish	Evaluation Of Retrofitted Oxygen Supplementation
Willamette	Anadromous Fish	Spring Chinook Outmigration In The Willamette
Willamette	Anadromous Fish	Evaluate Springfield Production Facilities
Willamette	Anadromous Fish	Clackamas River Side Channel Improvement
Willamette	Anadromous Fish	Mckenzie Focus Watershed
Willamette	Anadromous Fish	Mohawk Watershed Planning And Coordination
Willamette	Anadromous Fish	Multnomah Channel Riparian Habitat Restoration
Willamette	Anadromous Fish	Assess Mckenzie Watershed Habitat & Prioritize Proj
Willamette	Resident Fish	Assess Bull Trout- Mf Willamette / Mckenzie Basins
Willamette	Wildlife	Willamette Hydro Projects Wildlife Loss Study
Willamette	Wildlife	Willamette Hydro Projects - Wildlife Mitigation
Willamette	Wildlife	Burlington Bottoms - Phase I
Willamette	Wildlife	Burlington Bottoms Land Purchase
Willamette	Wildlife	Amazon Basin (Willow Creek - Eugene Wetlands)
Willamette	Wildlife	Willamette Basin Mitigation
Willamette	Wildlife	Burlington Bottoms Bridge Construction
Willamette	Wildlife	Tualatin River National Wildlife Refuge Additions
Fifteenmile Creek	Anadromous Fish	Fifteenmile Creek Habitat Enhancement
Fifteenmile Creek	Anadromous Fish	Fifteenmile Creek Habitat Enhancement- Phase Iv, V
Fifteenmile Creek	Anadromous Fish	Fifteenmile Creek Habitat Improvement
Fifteenmile Creek	Anadromous Fish	15 Mile Creek Steelhead Smolt Production
Fifteenmile Creek	Anadromous Fish	15 Mile Creek Water Right Acquisition
Fifteenmile Creek	Anadromous Fish	Evaluate Habitat Work Conducted In 15 Mile Creek
Hood	Anadromous Fish	West Fork Hood River Passage
Hood	Anadromous Fish	Lake Branch Creek Habitat Improvement
Hood	Anadromous Fish	Hood River Production Program M & E - Ctwisr
Hood	Anadromous Fish	Hood River Production Program M & E - ODFW
Hood	Anadromous Fish	Hood River - Parkdale O & M - Wst
Hood	Anadromous Fish	Hood River Production - Pelton Ladder Hatchery
Hood	Anadromous Fish	Design & Construct Powerdale Dam Facilities (ODFW)
Hood	Anadromous Fish	Hood River Production - Pelton Dam Ladder O & M
Hood	Anadromous Fish	Hood River Fish Habitat
Hood	Anadromous Fish	Hood River Fish Habitat
Klickitat	Anadromous Fish	Evaluation Of River Water For Klickitat Hatchery

Subbasin	Program	Title
Klickitat	Anadromous Fish	Klickitat Tribal Hatchery Preliminary Engineering
Klickitat	Anadromous Fish	Klickitat Passage & Habitat Preliminary Design
Klickitat	Anadromous Fish	Lower Klickitat Habitat Enhancement
Klickitat	Anadromous Fish	Klickitat River Sub-Basin Assessment
Columbia Gorge	Anadromous Fish	Upriver Egg Take At Bonneville Dam
Columbia Gorge	Anadromous Fish	Bonneville Dam Juvenile Fish Sampling Facility
Columbia Gorge	Anadromous Fish	Eval Factors Limiting Col R Chum Salmon Population
Columbia Gorge	Resident Fish	Bull Trout Assessment In The Columbia River Gorge
Wind	Anadromous Fish	Wind River Watershed
WIND	Anadromous Fish	WIND RIVER WATERSHED - USGS
WIND	Anadromous Fish	WIND RIVER WATERSHED - WDF&W
WIND	Anadromous Fish	WIND RIVER WATERSHED - USFS
WIND	Anadromous Fish	WIND RIVER WATERSHED - UCD
Methow	Anadromous Fish	NEPA Studies For The Methow River Project
Methow	Anadromous Fish	Methow River Valley Irrigation District - Yn
Methow	Anadromous Fish	Yn-Coho Supplementation Mid-Columbia Construction
Methow	Anadromous Fish	Restore Early Winters Creek Salmonid Habitat
Methow	Anadromous Fish	Goat Creek Salmonid Habitat Restoration
Methow	Anadromous Fish	Measure Mine Drainage Effects Alder Cr / Methow R
Okanogan	Anadromous Fish	Enloe Dam Passage
Okanogan	Anadromous Fish	Okanogan Focus Watershed
Okanogan	Anadromous Fish	Salmon Creek Instream Flow & Habitat Survey
Okanogan	Anadromous Fish	Salmon Creek Fish Barrier Removal And Water Lease
Okanogan	Anadromous Fish	Anadromous Fish Habitat & Passage In Omak Creek
Okanogan	Anadromous Fish	Eval Reintroduction Of Sockeye Salmon Skaha Lake
Okanogan	Wildlife	Scotch Creek Wildlife Enhancement
Okanogan	Wildlife	Columbia Basin Habitat Unit Acquisition - WDF&W
Upper Mid-Columbia	Anadromous Fish	Monitoring Out Migrating Salmon At Wells Dam -1984
Upper Mid-Columbia	Anadromous Fish	Juvenile Salmonid Monitoring At Rock Island Dam
Upper Mid-Columbia	Wildlife	Douglas County Pygmy Rabbit Habitat Project
Wenatchee	Anadromous Fish	Tumwater Falls / Dryden Dams Passage Plans
Wenatchee	Anadromous Fish	Improve The Tumwater Dam Passage
Wenatchee	Anadromous Fish	Improve The Dryden Dam Passage
Wenatchee	Anadromous Fish	Tumwater/ Dryden Passage Environmental Assessment
Wenatchee	Anadromous Fish	Design & Construction Of Dryden Fish Screens
Wenatchee	Anadromous Fish	Coho Restoration Mid-Columbia River Tributaries
Wenatchee	Anadromous Fish	Yn - Coho Supplementation In Mid Columbia O&M/M&E
Wenatchee	Anadromous Fish	Replace Chumstick Creek Culvert

Subbasin	Program	Title
Wenatchee	Anadromous Fish	Remove Barriers/Restore Instream Habitat
Wenatchee	Program Coordination	Return Of The Salmon - Wenatchee River Festival
Spokane Lower	Resident Fish	Archaeological Survey - Galbraith Springs
Spokane Lower	Resident Fish	Spokane (Galbraith Springs) Tribal Hatchery
Spokane Lower	Resident Fish	Spokane Tribal Hatchery - Engineering Consultant
Spokane Lower	Resident Fish	Spokane Tribal Hatchery Equipment
Spokane Lower	Resident Fish	Spokane Tribal Hatchery Manager Training Program
Spokane Lower	Wildlife	Blue Creek Winter Range - Spokane Reservation
Upper Columbia	Resident Fish	Colville Tribal Hatchery Construction And O&M
Upper Columbia	Resident Fish	Colville Tribal Fish Cultural Training Program
Upper Columbia	Resident Fish	Lake Roosevelt Kokanee & Stream Projects M&E
Upper Columbia	Resident Fish	Construct Sherman Creek Kokanee Hatchery
Upper Columbia	Resident Fish	Sherman Creek Hatchery Equipment
Upper Columbia	Resident Fish	Spokane Tribal (Galbraith Springs) Hatchery - O&M
Upper Columbia	Resident Fish	Sherman Creek Hatchery - O&M
Upper Columbia	Resident Fish	Sherman Pass Scenic Byway Visitor's Center
Upper Columbia	Resident Fish	Lake Roosevelt Data Collection
Upper Columbia	Resident Fish	Lake Roosevelt Rainbow Trout Net Pens
Upper Columbia	Resident Fish	Chief Joseph Kokanee Enhancement Project
Upper Columbia	Resident Fish	Hydroacoustic And Sonic Tag Tracking
Upper Columbia	Resident Fish	Resident Fish Above Chief Joe & Grand Coulee Dams
Upper Columbia	Resident Fish	Lake Roosevelt Kokanee Net Pens
Upper Columbia	Resident Fish	Lake Roosevelt Kokanee Net Pens
Upper Columbia	Wildlife	Grand Coulee Wildlife Mitigation Plan
Upper Columbia	Wildlife	Chief Joseph Dam Wildlife Loss Study & Mitigation
Upper Columbia	Wildlife	Lake Roosevelt Peregrine Falcon Reintroduction
Upper Columbia	Wildlife	Colville Wildlife Mitigation Coordination
Upper Columbia	Wildlife	Colville Tribe Habitat Unit Acquisition
Upper Columbia	Wildlife	Spokane Tribe Grande Coulee Mitigation
Upper Columbia	Wildlife	Colville Confederated Tribe HEP Training
San Poil	Resident Fish	Habitat Projects - Lake Roosevelt Tributaries
San Poil	Wildlife	Hellsgate Big Game Winter Range - Colville Tribe
Bitterroot	Resident Fish	Painted Rocks Reservoir Water Management Plan
Clark Fork	Resident Fish	Cabinet Gorge Hatchery
Clark Fork	Resident Fish	Evaluate Kokanee Stocking & Cabinet Gorge Hatchery
Clark Fork	Resident Fish	Engineering Evaluation Of Cabinet Gorge Hatchery
Clark Fork	Resident Fish	Cabinet Gorge Hatchery Improvements
Clark Fork	Wildlife	Cabinet Gorge Eagle Study

Subbasin	Program	Title
Clark Fork	Wildlife	Video Of Cabinet Gorge Hatchery & Eagle Project
Clark Fork	Wildlife	Albeni Falls Wildlife Loss Study & Mitigation Plan
Flathead	Resident Fish	Effects Of Kerr & Hungry Horse Dams On Kokanee
Flathead	Resident Fish	Cumulative Impact Of Micro Hydro Sites, Swan R
Flathead	Resident Fish	Lower Flathead River Fisheries Study
Flathead	Resident Fish	Hungry Horse Reservoir Impacts On Resident Fish
Flathead	Resident Fish	Determine Fish Habitat Losses- South Fork Flathead
Flathead	Resident Fish	Flathead River Fish And Wildlife Film
Flathead	Resident Fish	Hungry Horse Fisheries Mitigation
Flathead	Resident Fish	Flathead Lake - Monitoring For Kokanee Success
Flathead	Resident Fish	Flathead River Fishery Monitoring & Enhancement
Flathead	Resident Fish	Fishery Habitat Improvements - Flathead Basin
Flathead	Resident Fish	Creston Nfh Production & Nonnative Fish Removal
Flathead	Resident Fish	Hungry Horse Selective Withdrawal Design
Flathead	Resident Fish	Hungry Horse - Excessive Withdrawal Mitigation
Flathead	Resident Fish	Flathead River Native Species - MFWP
Flathead	Resident Fish	Flathead River Instream Flow
Flathead	Resident Fish	Flathead Focus Watershed Coordination
Flathead	Resident Fish	Mit Excessive Drawdowns Hungry Horse/Libby Res
Flathead	Resident Fish	Mit Excessive Drawdowns Hungry Horse Component
Flathead	Wildlife	Flathead Lake Level Impact On Canadian Geese
Flathead	Wildlife	Hungry Horse & Clark Fork Dams' Effect On Wildlife
Flathead	Wildlife	Water Level Impacts On Flathead Geese
Flathead	Wildlife	Hungry Horse Dam Wildlife Habitat Enhancement
Flathead	Wildlife	Montana Wildlife Conservation Easement
Kootenai	Anadromous Fish	Flow Effects On Cottonwood Ecosystems
Kootenai	Resident Fish	Libby Reservoir Levels & Impacts On Resident Fish
Kootenai	Resident Fish	Kootenai River Tributaries Flow & Fish Study
Kootenai	Resident Fish	Experimental White Sturgeon Supplement Research
Kootenai	Resident Fish	Experimental Kootenai Sturgeon Hatchery & Research
Kootenai	Resident Fish	Kootenai River Fisheries Investigations
Kootenai	Resident Fish	Develop Breeding Plans For Kootenai Fish Species
Kootenai	Resident Fish	Mitigation For Excessive Drawdown -Libby Reservoir
Kootenai	Resident Fish	Kootenai River White Sturgeon - M & E
Kootenai	Resident Fish	Kootenai River Resident Fish Assessments
Kootenai	Resident Fish	Libby Reservoir Mitigation Plan
Kootenai	Resident Fish	Kootenai Focus Watershed Coordination
Kootenai	Resident Fish	Protect Wigwam R Bull Trout-Kooscanusa Reservation

Subbasin	Program	Title
Kootenai	Resident Fish	Eval Sediment Transport Spawn Habitat Kootenai Id
Kootenai	Wildlife	Ural-Tweed Bighorn Sheep Habitat Improvement
Kootenai	Wildlife	Ural-Tweed Bighorn Sheep Population Study
Kootenai	Wildlife	Video Production On Bighorn Sheep In Montana
Kootenai	Wildlife	Filming Of The Bighorn Sheep Project, Montana
Kootenai	Wildlife	Film Of West Montana BPA Fish & Wildlife Projects
Kootenai	Wildlife	Develop NW Montana Wildlife Enhancement Plans
Kootenai	Wildlife	Montana Wildlife Easements & Land Acquisition Plan
Kootenai	Wildlife	Libby Dam Wildlife Habitat Enhancement
Kootenai	Wildlife	Libby Dam Wildlife Enhancement Project
Kootenai	Wildlife	Boundary Creek Wildlife Mitigation
Pend Oreille	Resident Fish	Assess Fishery & Needs - Pend Oreille River
Pend Oreille	Resident Fish	Kokanee Impacts- Lake Pend Oreille
Pend Oreille	Resident Fish	Lake Pend Oreille Kokanee Mitigation Research
Pend Oreille	Resident Fish	Kalispel Tribe Resident Fish Project
Pend Oreille	Resident Fish	Kalispel Resident Fish Hatchery Construction
Pend Oreille	Resident Fish	Kalispel Bass Hatchery O&M
Pend Oreille	Resident Fish	Kalispel Resident Fish Habitat Improvement
Pend Oreille	Resident Fish	Kalispel Box Canyon Watershed Project
Pend Oreille	Wildlife	Kalispel - Pend Oreille Wetlands Acquisition
Pend Oreille	Wildlife	Kalispel - Pend Oreille Wetlands 2
Pend Oreille	Wildlife	Pend Oreille Wetlands - IDFG Phase I
Pend Oreille	Wildlife	Pend Oreille Wetlands - IDFG MOA
Pend Oreille	Wildlife	Pend Oreille Wildlife Mitigation O&M - IDFG
Pend Oreille	Wildlife	Albeni Falls Wildlife Mitigation Kootenai Tribe Id
Pend Oreille	Wildlife	Albeni Falls WI Mitigation - Coeur d'Alene Tribe
Pend Oreille	Wildlife	Little Pend Oreille River (Weir)
Coeur d'Alene	Resident Fish	Coeur d'Alene Reservation Fishery Enhancement
Coeur d'Alene	Resident Fish	Lake Creek Land Acquisition - Coeur d'Alene Basin
Coeur d'Alene	Resident Fish	Coeur d'Alene Trout Production Facility
Coeur d'Alene	Wildlife	Albeni Falls Dam W/L Mitigation - Kalispel Tribe
Asotin	Anadromous Fish	Southeast Washington Species Interaction Study
Asotin	Anadromous Fish	Eastern WA Model Watershed Development
Asotin	Anadromous Fish	Asotin Watering Troughs
Asotin	Anadromous Fish	Asotin Creek Model Watershed Placeholder
Asotin	Anadromous Fish	Asotin Creek Early Action Projects
Asotin	Anadromous Fish	Asotin Creek Upland Sedimentation Reduction
Asotin	Anadromous Fish	Asotin Creek Channel & Fish Habitat Restoration

Subbasin	Program	Title
Asotin	Anadromous Fish	Asotin Watershed Upland BMPs
Asotin	Anadromous Fish	Asotin Creek Riparian Fencing/Rock Blasting
Asotin	Anadromous Fish	Asotin Creek Woody Materials
Asotin	Anadromous Fish	Asotin Creek Fish/Structure Monitoring
Asotin	Anadromous Fish	Asotin Watershed Channel And Riparian Restoration
Asotin	Anadromous Fish	Asotin Creek Information And Education
Asotin	Anadromous Fish	Asotin Watershed Project Implementation
Asotin	Anadromous Fish	Asotin Creek Five Year Minimum Till Program
Asotin	Anadromous Fish	Asotin Creek Instream Project Monitoring
Asotin	Anadromous Fish	Asotin Creek Channel Restoration
Asotin	Anadromous Fish	Asotin Watershed Upland BMP Implementation
Asotin	Anadromous Fish	Asotin Watershed Yellow Star Thistle Control
Asotin	Anadromous Fish	Asotin Creek Native Tree Nursery
Asotin	Anadromous Fish	Asotin Cr Isco Water & Macro-Invertebrate Sampling
Asotin	Anadromous Fish	GIS Mapping Of Asotin Creek Watershed Habitat
Asotin	Anadromous Fish	Asotin Creek Riparian Planting
Asotin	Anadromous Fish	Asotin Creek Riparian Fencing Projects
Asotin	Anadromous Fish	Asotin Cr Channel, Floodplain Riparian Restoration
Snake Hells Canyon	Anadromous Fish	Study Of Fall Chinook Outplanted-Abv Lower Granite
Snake Hells Canyon	Anadromous Fish	M&E Of Yearling Fall Chinook Above Lower Granite
Snake Hells Canyon	Anadromous Fish	Pittsburg Landing Acclimation Facility - Snake R
Snake Hells Canyon	Anadromous Fish	Capt John Rapids Acclimation Facility - Snake R
Snake Hells Canyon	Resident Fish	Evaluate Snake River Sturgeon Population
Grande Ronde	Anadromous Fish	Peavine Creek Habitat Improvement
Grande Ronde	Anadromous Fish	Joseph Creek & Grande Ronde River Habitat Work
Grande Ronde	Anadromous Fish	Joseph Creek & Grande Ronde River Habitat Work
Grande Ronde	Anadromous Fish	NE Oregon Spring Chinook Outplanting/Facility
Grande Ronde	Anadromous Fish	NE Oregon Hatchery Master Plan - CTUIR
Grande Ronde	Anadromous Fish	NE Oregon Outplanting Facilities Plan - ODFW
Grande Ronde	Anadromous Fish	NE Oregon Outplanting Facilities Master Plan (NPT)
Grande Ronde	Anadromous Fish	Classify Ecosystem Types - Blue Mountains
Grande Ronde	Anadromous Fish	Grande Ronde Model Watershed Development
Grande Ronde	Anadromous Fish	Life Studies Of Spring Chinook -Grande Ronde River
Grande Ronde	Anadromous Fish	Land / Water Acquisition Legal Support
Grande Ronde	Anadromous Fish	Grand Ronde, Imnaha, & John Day Telemetry Tracking
Grande Ronde	Anadromous Fish	Grande Ronde Model Watershed Habitat Projects
Grande Ronde	Anadromous Fish	Catherine Creek Diversion Dam Replacement
Grande Ronde	Anadromous Fish	Fox Hill Road Improvements, Grande Ronde Basin

Subbasin	Program	Title
Grande Ronde	Anadromous Fish	Clearwater Ditch Diversion (Grande Ronde Basin)
Grande Ronde	Anadromous Fish	Lower Valley Consolidated Diversion- Wallowa River
Grande Ronde	Anadromous Fish	Upper Grande Ronde (Large Woody Debris)
Grande Ronde	Anadromous Fish	Minam / Mt Harris Road Improvement- Grande Ronde
Grande Ronde	Anadromous Fish	Technical Support - Grand Ronde Model Watershed
Grande Ronde	Anadromous Fish	Wallowa Basin Project Planning
Grande Ronde	Anadromous Fish	Camp Carson Mine Reclamation, Upper Grande Ronde
Grande Ronde	Anadromous Fish	Indian Creek Habitat Restoration (Grande Ronde)
Grande Ronde	Anadromous Fish	Bonneville Hatchery Captive Broodstock (NE Oregon)
Grande Ronde	Anadromous Fish	Lagrande USFS District Early Action Projects
Grande Ronde	Anadromous Fish	Boise Cascade Riparian Fencing- Grande Ronde
Grande Ronde	Anadromous Fish	Wallowa Valley USFS District Early Action Projects
Grande Ronde	Anadromous Fish	Etiology Of "Head Burns" In Adult Salmonids
Grande Ronde	Anadromous Fish	Catherine Creek Road Erosion, Grande Ronde Basin
Grande Ronde	Anadromous Fish	Lower Leap Range Improvement, Trout Creek Basin
Grande Ronde	Anadromous Fish	Bear Creek Road Resurfacing, Grande Ronde Basin
Grande Ronde	Anadromous Fish	Union County Swcd Early Action Projects
Grande Ronde	Anadromous Fish	Union County Swcd Old Projects
Grande Ronde	Anadromous Fish	Repair Damage From Lower Wenaha Flood
Grande Ronde	Anadromous Fish	Construct Tulley Hill Diversion, Wallowa Basin
Grande Ronde	Anadromous Fish	Wallowa Swcd - Old Projects
Grande Ronde	Anadromous Fish	Wallowa Swcd - Early Action Projects
Grande Ronde	Anadromous Fish	Union County Public Works - Old Projects
Grande Ronde	Anadromous Fish	Union County Public Works - Early Action Projects
Grande Ronde	Anadromous Fish	Grande Ronde Watershed Restoration - CTUIR
Grande Ronde	Anadromous Fish	Mccoy Meadows Watershed Restoration
Grande Ronde	Anadromous Fish	CTUIR - Mcintyre Creek Road Relocation
Grande Ronde	Anadromous Fish	Union Wastewater Plant Improvements, Grande Ronde
Grande Ronde	Anadromous Fish	Streambank Restoration - Biomat Project
Grande Ronde	Anadromous Fish	Chicken Creek Habitat Improvement, Grande Ronde
Grande Ronde	Anadromous Fish	N Fk Clark Creek Large Woody Debris Addition
Grande Ronde	Anadromous Fish	South Fork Spring Creek Channel Rehabilitation
Grande Ronde	Anadromous Fish	Grande Ronde Valley Stream Gauging
Grande Ronde	Anadromous Fish	Birkmaier Streambank Protection
Grande Ronde	Anadromous Fish	Wallowa Swcd Streambank Protection
Grande Ronde	Anadromous Fish	Imnaha River Smolt Monitoring - Nez Perce Tribe
Grande Ronde	Anadromous Fish	Wallowa County/Nez Perce Salmon Habitat Recovery
Grande Ronde	Anadromous Fish	Phillips Creek Road

Subbasin	Program	Title
Grande Ronde	Anadromous Fish	Middle Fork Clark Creek
Grande Ronde	Anadromous Fish	Meadow Creek Enhancement Evaluation - OSU
Grande Ronde	Anadromous Fish	Meadow Creek Enhancement Evaluation - USFS
Grande Ronde	Anadromous Fish	Union County Watershed Projects - Swcd
Grande Ronde	Anadromous Fish	Upper Grande Ronde River Riparian Fencing
Grande Ronde	Anadromous Fish	Software For Grande Ronde Model Watershed
Grande Ronde	Anadromous Fish	Sheep Ranch Riparian Project
Grande Ronde	Anadromous Fish	Tybo Canyon Leafy Spurge Project
Grande Ronde	Anadromous Fish	Off-Site Water Developments
Grande Ronde	Anadromous Fish	Lower Five Points Off-Site Water Development
Grande Ronde	Anadromous Fish	Catherine Cr Riparian Pasture & Water Development
Grande Ronde	Anadromous Fish	Upper Grande Ronde & Sheep Cr Instream Structures
Grande Ronde	Anadromous Fish	Upper Grande Ronde Riparian Rehabilitation
Grande Ronde	Anadromous Fish	Upper Grande Ronde River Whole Tree Project
Grande Ronde	Anadromous Fish	Camp Cr Riparian Fence & Water Site Development
Grande Ronde	Anadromous Fish	Camp One Restoration
Grande Ronde	Anadromous Fish	Bear & Prairie Creeks Habitat Work
Grande Ronde	Anadromous Fish	Catherine Cr & Grande Ronde R Habitat Work
Grande Ronde	Anadromous Fish	Lostine & Hurricane Creeks Habitat Projects
Grande Ronde	Anadromous Fish	Lick Creek Water Gap li
Grande Ronde	Anadromous Fish	Bear Cr, R-Y Timber Grazing & Road Plan
Grande Ronde	Anadromous Fish	N Fork Clark Cr / Hindman Rd Crossing Improvement
Grande Ronde	Anadromous Fish	Hamilton Streambank Stabilization / Grande Ronde R
Grande Ronde	Anadromous Fish	Alicel Dike Improvement - Grande Ronde
Grande Ronde	Anadromous Fish	Troy Streambank Protection / Wallowa River
Grande Ronde	Anadromous Fish	Phillips Creek Stream Habitat Enhancement
Grande Ronde	Anadromous Fish	Warm Spring Creek Riparian Improvement
Grande Ronde	Anadromous Fish	Little Dark Canyon Creek
Grande Ronde	Anadromous Fish	Cottonwood Creek Riparian Enhancement/Wallowa
Grande Ronde	Anadromous Fish	Water Quality Monitoring For Grande Ronde Basin
Grande Ronde	Anadromous Fish	Catherine Creek State Park Interpretive Sign
Grande Ronde	Anadromous Fish	Construction Of Grande Ronde Satellite Facilities
Grande Ronde	Anadromous Fish	Grande Ronde Supplementation Facilities- O&M -NPT
Grande Ronde	Anadromous Fish	Grande Ronde Supplementation - O&M -CTUIR
Grande Ronde	Anadromous Fish	Grande Ronde Supplementation - O&M - ODFW
Grande Ronde	Anadromous Fish	Grande Ronde Supplementation - Design
Grande Ronde	Anadromous Fish	Grande Ronde Supplementation - Scientific Review
Grande Ronde	Anadromous Fish	Grande Ronde Captive Brood O&M / M&E

Subbasin	Program	Title
Grande Ronde	Anadromous Fish	Captive Broodstock Artificial Propagation
Grande Ronde	Anadromous Fish	Grande Ronde Mainstem Enhancement, USFS
Grande Ronde	Anadromous Fish	Grande Ronde Mainstem Enhancement - CTUIR
Grande Ronde	Anadromous Fish	Five Points Creek Whole Tree Additions
Grande Ronde	Anadromous Fish	Dark Canyon Watershed Restoration
Grande Ronde	Anadromous Fish	Mcintyre Creek Road Relocation - USFS
Grande Ronde	Anadromous Fish	Mcintyre Road Relocation - Union County
Grande Ronde	Anadromous Fish	Mcintyre Road Relocation - USFS
Grande Ronde	Anadromous Fish	Grouse Creek Culvert Replacement
Grande Ronde	Anadromous Fish	Meadow Creek/Cuna Ranches Riparian Restoration
Grande Ronde	Anadromous Fish	Joseph Creek Watershed Improvement
Grande Ronde	Anadromous Fish	Lookingglass Creek Road Obliteration
Grande Ronde	Anadromous Fish	Grande Ronde Nutrient Presentation
Grande Ronde	Anadromous Fish	Union County Technical Engineering Assistance
Grande Ronde	Anadromous Fish	Wallowa County Technical Engineering Assistance
Grande Ronde	Anadromous Fish	Water Temp Manipulation & Data Sharing Software
Grande Ronde	Anadromous Fish	Wet Meadow Inventory And Assessment
Grande Ronde	Anadromous Fish	Grande Ronde Basin Gauging Station Monitoring
Grande Ronde	Anadromous Fish	Grande Ronde Water Quality Monitoring
Grande Ronde	Anadromous Fish	Upper Grande Ronde & Catherine Cr/USFS Ws Rest
Grande Ronde	Anadromous Fish	Grande Ronde - Union Swcd Chan, Rd & Passage Rest
Grande Ronde	Anadromous Fish	Grande Ronde - Union Swcd Riparian, Upland Rest
Grande Ronde	Anadromous Fish	Grande Ronde - Union County Rd, Sediment Reduction
Grande Ronde	Anadromous Fish	Alpine Meadows - Trout Creek Restoration
Grande Ronde	Anadromous Fish	Grande Ronde Basin Temperature Assessment
Grande Ronde	Anadromous Fish	Grande Ronde River Basin Temperature Assessment
Grande Ronde	Anadromous Fish	Wallowa County Gauging Stations
Grande Ronde	Anadromous Fish	Hagedorn Road Relocation/Stream Restoration
Grande Ronde	Anadromous Fish	Wildcat Creek Culvert Replacement
Grande Ronde	Anadromous Fish	Grande Ronde Basin Tech Engineering Assistance
Grande Ronde	Anadromous Fish	Little Fly Meadow Headcut Rehabilitation
Grande Ronde	Anadromous Fish	Wallowa County Direct Seeding
Grande Ronde	Anadromous Fish	Crow Cr Star Thistle Containment & Riparian Enhance
Grande Ronde	Anadromous Fish	Beaver Creek Fish Passage
Grande Ronde	Anadromous Fish	Gordon Creek/Grand Ronde Streambank Stabilization
Grande Ronde	Anadromous Fish	East End Road Obliteration And Sediment Reduction
Grande Ronde	Anadromous Fish	Research/Evaluate Restoration Of NE Oregon Streams
Grande Ronde	Anadromous Fish	Research Stream Restoration (U Of O)

Subbasin	Program	Title
Grande Ronde	Anadromous Fish	Bear Gulch Restoration Watershed
Grande Ronde	Anadromous Fish	Upper Wildcat & Joseph Creek Watershed Improvement
Grande Ronde	Anadromous Fish	Meadow Cr Habberstad Property Instream Restoration
Grande Ronde	Anadromous Fish	Mccooy Cr Alta Cunha Ranches Instream Restoration
Grande Ronde	Anadromous Fish	Grande Ronde Culvert Replacement - USFS
Grande Ronde	Anadromous Fish	Grande Ronde River Fencing - USFS
Grande Ronde	Anadromous Fish	Lostine River Passage
Grande Ronde	Program Coordination	Cost Effectiveness Analysis & Model Enhancement
Grande Ronde	Wildlife	Nez Perce NE Oregon Wildlife Project: Helm Tract
Grande Ronde	Wildlife	CTUIR Habitat Units Acquisition
Grande Ronde	Wildlife	Ladd Marsh
Grande Ronde	Wildlife	WI Mitigation Sites Oregon, Wenaha Wma Additions
Grande Ronde	Wildlife	WI Mitigation Sites Oregon, Ladd Marsh Additions
Imnaha	Anadromous Fish	Imnaha River Smolt Monitoring Program
Imnaha	Anadromous Fish	NE Oregon Hatchery Master Plan - Nez Perce
Imnaha	Anadromous Fish	Imnaha Steelhead Rearing, Release And M&E
Imnaha	Anadromous Fish	Evaluate Supplementing Imnaha Summer Steelhead
Imnaha	Anadromous Fish	Bear Creek & Sheep Creek Habitat Projects (NPT)
Imnaha	Anadromous Fish	Nez Perce Master Contract
Imnaha	Anadromous Fish	Sheep Creek Watershed Restoration
Imnaha	Anadromous Fish	Marr Flat Allotment & Big Sheep/Imnaha Fisheries
Imnaha	Anadromous Fish	Imnaha/Parks Ditch Water Conservation Program
Clearwater	Anadromous Fish	Inventory Of Nez Perce Reservation Streams
Clearwater	Anadromous Fish	Nez Perce Tribal Hatchery
Clearwater	Anadromous Fish	Final Design - Nez Perce Tribal Hatchery
Clearwater	Anadromous Fish	Heath Farms Nez Perce Hatchery Site Investigation
Clearwater	Anadromous Fish	Nez Perce Tribal Hatchery Monitoring And Evaluation
Clearwater	Anadromous Fish	Nez Perce Tribal Hatchery Planning And Design
Clearwater	Anadromous Fish	Nez Perce Tribal Hatchery Construction
Clearwater	Anadromous Fish	Nez Perce Tribal Hatchery O & M
Clearwater	Anadromous Fish	Red River Fish Habitat Improvement
Clearwater	Anadromous Fish	Crooked River Passage
Clearwater	Anadromous Fish	Lolo, Crooked Fork & White Sands Cr Habitat Work
Clearwater	Anadromous Fish	Red & Crooked Rivers Habitat/ Passage Improvements
Clearwater	Anadromous Fish	Lolo, Crooked Fork & El Dorado Creeks Habitat Work
Clearwater	Anadromous Fish	Clearwater Basin Habitat Improvement Study
Clearwater	Anadromous Fish	Orofino Creek Passage Study
Clearwater	Anadromous Fish	Lower Clearwater Habitat Study

Subbasin	Program	Title
Clearwater	Anadromous Fish	Nez Perce Technical Support - IDFG
Clearwater	Anadromous Fish	Salmon Supplementation Studies In Idaho - USFWS
Clearwater	Anadromous Fish	Supplementation Of Steelhead Production In Idaho
Clearwater	Anadromous Fish	Law Enforcement Transition Funding - Shoban
Clearwater	Anadromous Fish	Little Ponderosa Ranch Purchase, Red River Meadow
Clearwater	Anadromous Fish	Red River Restoration (Little Ponderosa Ranch)
Clearwater	Anadromous Fish	Haysfork Gloryhole Rehabilitation
Clearwater	Anadromous Fish	Assess Chinook Restoration (Snake River Basin)
Clearwater	Anadromous Fish	Nez Perce NF Early Action Watershed Projects
Clearwater	Anadromous Fish	Meadow Creek Restoration - USFS
Clearwater	Anadromous Fish	Protect And Restore Lolo Creek Watershed
Clearwater	Anadromous Fish	Protect & Restore Squaw & Papoose Cr Watersheds
Clearwater	Anadromous Fish	Lower Eldorado Falls Fish Passage Improve Design
Clearwater	Anadromous Fish	Restore Mccommas Meadows - NPT
Clearwater	Anadromous Fish	Clearwater Focus Watershed - State Of Idaho
Clearwater	Anadromous Fish	Clearwater River Subbasin Ecosystem Assessment
Clearwater	Anadromous Fish	Clearwater Focus Watershed - Nez Perce Tribe
Clearwater	Anadromous Fish	Clearwater River Sub-Basin Assessment
Clearwater	Anadromous Fish	Gas Bubble Disease Clearwater River Resident Fish
Clearwater	Anadromous Fish	Review Of F&W Production Initiatives
Clearwater	Anadromous Fish	Big Canyon Acclimation Facility - Clearwater R
Clearwater	Anadromous Fish	Burgdorf Meadows
Clearwater	Anadromous Fish	Restore Anadromous Fish Habitat - Little Canyon Cr
Clearwater	Anadromous Fish	Restore Anadromous Fish Habitat - Nichols Canyon
Clearwater	Anadromous Fish	Protecting & Restoring Big Canyon Creek Watershed
Clearwater	Anadromous Fish	Rehabilitate Lapwai Creek
Clearwater	Anadromous Fish	Qualify/Quantify Residual Steelhead In Clearwater
Clearwater	Anadromous Fish	Meadow Creek Restoration Research - UI
Clearwater	Anadromous Fish	Eval Pacific Lamprey In Clearwater R Drainage IDFG
Clearwater	Anadromous Fish	Protect N Lochsa Face Analysis Area Watershed
Clearwater	Anadromous Fish	Rehabilitate Newsome Creek - S Fork Clearwater R
Clearwater	Anadromous Fish	Protect And Restore Mill Creek Watershed
Clearwater	Anadromous Fish	F&W Conservation Enforcement Nez Perce Watersheds
Clearwater	Resident Fish	Dworshak Resident Fish Study / IDFG
Clearwater	Resident Fish	Nez Perce Dworshak Model For Rainbow Trout & Bass
Clearwater	Resident Fish	Nez Perce Trout Ponds - Design, Construct And O&M
Clearwater	Resident Fish	Genetic Inventory - Westslope Cutthroat Trout
Clearwater	Wildlife	Dworshak Wildlife Mitigation And Enhancement Plan

Subbasin	Program	Title
Clearwater	Wildlife	Dworshak Wildlife Mitigation And Enhancement Plan
Clearwater	Wildlife	Dworshak Wildlife Mitigation & Enhancement
Clearwater	Wildlife	Lower Clearwater Aquatic Mammal Study
Clearwater	Wildlife	Purchase Dworshak Old Growth
Clearwater	Wildlife	Dworshak Wildlife Mitigation Trust
Salmon	Anadromous Fish	Bear Valley, Yankee & East Forks Habitat Work
Salmon	Anadromous Fish	Increase Alturas Lake Cr Flow / Busterback Ranch
Salmon	Anadromous Fish	Pole Creek Irrigation Diversion Screening
Salmon	Anadromous Fish	Camas Creek Riparian Protection
Salmon	Anadromous Fish	Marsh, Elk Creek & Upper Salmon River Habitat Work
Salmon	Anadromous Fish	Lemhi River Rehabilitation Study
Salmon	Anadromous Fish	Panther Creek Habitat Rehabilitation Study
Salmon	Anadromous Fish	Newsclips Of Idaho Salmon Habitat Projects
Salmon	Anadromous Fish	Evaluate Supplementing The Salmon And Clearwater
Salmon	Anadromous Fish	Salmon Supplementation Studies In Idaho- Nez Perce
Salmon	Anadromous Fish	Salmon Supplementation In Idaho- Shoshone-Bannock
Salmon	Anadromous Fish	Pit Tagging Wild Chinook
Salmon	Anadromous Fish	Snake River Sockeye Habitat & Limnological Study
Salmon	Anadromous Fish	Redfish Lake Sockeye Rearing And Trapping
Salmon	Anadromous Fish	Idaho Natural Production Monitoring And Evaluation
Salmon	Anadromous Fish	Genetics Literature Search - Snake River Salmonids
Salmon	Anadromous Fish	Model Watershed Studies - Lemhi River Basin
Salmon	Anadromous Fish	Develop Life Cycle Model & Apply To Idaho Salmon
Salmon	Anadromous Fish	Redfish Lake Sockeye Broodstock Rearing/Research
Salmon	Anadromous Fish	Mark Chinook- Rapid River / Pahsimeroi Hatcheries
Salmon	Anadromous Fish	S Fk Salmon River Anadromous Fish Enhancement
Salmon	Anadromous Fish	Upper Salmon River Anadromous Fish Passage
Salmon	Anadromous Fish	Idaho Fish Screening Improvement
Salmon	Anadromous Fish	Idaho Model Watershed Habitat Projects
Salmon	Anadromous Fish	Pahsimeroi River - Patterson / Big Springs Flow
Salmon	Anadromous Fish	East Fork Salmon/ Pahsimeroi Habitat (Custer Co)
Salmon	Anadromous Fish	Lemhi Habitat Enhancement Project
Salmon	Anadromous Fish	Salmon River Habitat Enhancement And O&M
Salmon	Anadromous Fish	Upper Salmon River Diversion Consolidation Program
Salmon	Anadromous Fish	Pit Tagging Rapid River & Pahsimeroi Chinook Stock
Salmon	Anadromous Fish	Johnson Creek Artificial Propagation Enhancement
Salmon	Anadromous Fish	Johnson Creek Scientific Review
Salmon	Anadromous Fish	Pre Design - Johnson Cr Artificial Propagation

Subbasin	Program	Title
Salmon	Anadromous Fish	Johnson Creek Wetlands Delineation
Salmon	Anadromous Fish	Johnson Creek Real Estate Services
Salmon	Anadromous Fish	Fish Habitat Improvement - Lemhi Swcd
Salmon	Anadromous Fish	Idaho Model Watershed Fish Habitat Improvement
Salmon	Anadromous Fish	Rehabilitation Of Johnson Creek / Cox Ranch
Salmon	Anadromous Fish	Idaho Chinook Salmon Captive Rearing
Salmon	Anadromous Fish	Listed Stock Adult Escapement Monitoring
Salmon	Anadromous Fish	Listed Stock Chinook Salmon Gamete Preservation
Salmon	Anadromous Fish	Salmon River Production Program
Salmon	Anadromous Fish	Idaho Captive Rearing Initiative -Salmon R Chinook
Salmon	Anadromous Fish	Restore Salmon River - Challis Area
Salmon	Anadromous Fish	Aquatic Ecosystem Review - Challis
Salmon	Anadromous Fish	Analyze Persistence/Dynamics Snake R Chinook
Salmon	Anadromous Fish	Aquatic Ecosystem Review - Salmon River
Salmon	Anadromous Fish	Protect Bear Valley Salmon & Steelhead Spawn Hab
Salmon	Wildlife	Craig Mountain (Dworshak Wildlife) Management
Salmon	Wildlife	Dworshak Wildlife Mitigation Agreement Mediation
Malheur	Resident Fish	Stinking Water Salmonid Project
Malheur	Resident Fish	N Fork Malheur Bull & Redband Trout Life History
Malheur	Wildlife	Burns-Paiute Tribe Fish And Wildlife Coordinator
Malheur	Wildlife	Logan Valley Wildlife Mitigation Project
Malheur	Wildlife	Acquisition Of Malheur Wildlife Mitigation Site
Middle Snake	Resident Fish	Snake River Native Salmonid Assessment
Middle Snake	Resident Fish	Sturgeon Study- Hells Canyon & Oxbow Reservoirs
Owyhee	Resident Fish	Duck Valley Resident Fish Project
Owyhee	Resident Fish	Duck Valley Resident Fish Stocking
Owyhee	Resident Fish	Lake Billy Shaw - Duck Valley Reservation
Owyhee	Resident Fish	Lake Billy Shaw Tribal Coordinator
Owyhee	Resident Fish	BOR Technical Review Billy Shaw Dam, Duck Valley
Owyhee	Resident Fish	Lake Billy Shaw Final Design, Duck Valley
Owyhee	Resident Fish	Lake Billy Shaw Research Development
Owyhee	Resident Fish	Billy Shaw Construction
Owyhee	Resident Fish	Lake Billy Shaw O&M
Owyhee	Resident Fish	Duck Valley Reservation Habitat Enhancement
Owyhee	Wildlife	Shoshone-Paiute Tribes - Wildlife Coordination
Payette	Wildlife	Black Canyon & Anderson Ranch Dams - Wildlife Loss
Upper Snake	Anadromous Fish	Protection Of Upper Snake Wild Adult Steelhead
Upper Snake	Anadromous Fish	Idaho Water Rental - Fish & Wildlife Impacts

Subbasin	Program	Title
Upper Snake	Resident Fish	Study Proposed Tribal Trout Hatchery (Snake Basin)
Upper Snake	Resident Fish	Habitat Improvement - Fort Hall Bottoms
Upper Snake	Resident Fish	Master Plan/ Sho-Ban & Sho-Paiute Trout Hatchery
Upper Snake	Wildlife	Wildlife Loss Assessment For Palisades Dam
Upper Snake	Wildlife	Upper Snake Hydro Projects Wildlife Mitigation
Upper Snake	Wildlife	Minidoka Wildlife Loss Study And Mitigation Plan
Upper Snake	Wildlife	Minidoka Dam Wildlife Mitigation Plan
Upper Snake	Wildlife	South Fork Snake Wildlife Riparian Project
Upper Snake	Wildlife	Camas Prairie Wildlife Mitigation Project Phase I
Upper Snake	Wildlife	South Fork Snake / Sand Creek Wildlife Projects
Upper Snake	Wildlife	South Idaho Wildlife Mitigation Projects -(IDFG)
Upper Snake	Wildlife	Southern Idaho Wildlife Mitigation - Shoban Tribes
Upper Snake	Wildlife	South Fork Snake (Soda Hills)
Upper Snake	Wildlife	Deer Parks Complex Wildlife Habitat
Upper Snake	Wildlife	Soda Springs Hills Wildlife Mitigation O&M
Systemwide	Anadromous Fish	Imprinting Of Salmon And Steelhead For Homing
Systemwide	Anadromous Fish	Genetic Identification Study
Systemwide	Anadromous Fish	Columbia Hatchery Contributions To Chinook Fishery
Systemwide	Anadromous Fish	Power Peaking Effects- Fall Chinook Egg Incubation
Systemwide	Anadromous Fish	Survey Fish Screens & Ladders At Water Withdrawals
Systemwide	Anadromous Fish	Smolt Monitoring Program
Systemwide	Anadromous Fish	Assemble & Analyze Anadromous Fishery Data
Systemwide	Anadromous Fish	Columbia River Coded-Wire Tag Recovery
Systemwide	Anadromous Fish	Barge Transportation Study
Systemwide	Anadromous Fish	Predation And Development Of Prey Protection
Systemwide	Anadromous Fish	Develop Effective Media For Juvenile Chinook
Systemwide	Anadromous Fish	Study Stress On Transported Chinook Smolts
Systemwide	Anadromous Fish	Snake River Fall Chinook Brood Program
Systemwide	Anadromous Fish	Bioenergetics Of Outmigrant Salmon
Systemwide	Anadromous Fish	Predation Index / Model & Harvest Option
Systemwide	Anadromous Fish	Coded-Wire Tag Recovery
Systemwide	Anadromous Fish	Coded Wire Tag - PSMFC
Systemwide	Anadromous Fish	Coded Wire Tag - ODFW
Systemwide	Anadromous Fish	Coded Wire Tag - USFWS
Systemwide	Anadromous Fish	Coded Wire Tag - WDFW
Systemwide	Anadromous Fish	Development Of New Concepts In Fish Ladder Design
Systemwide	Anadromous Fish	Rapid Diagnosis Of IHN Virus
Systemwide	Anadromous Fish	IHN Virus Control

Subbasin	Program	Title
Systemwide	Anadromous Fish	Ihn Virus Workshop
Systemwide	Anadromous Fish	Workshop On Small Hydropower Plants
Systemwide	Anadromous Fish	Smolt Marking - USFWS
Systemwide	Anadromous Fish	Idaho Habitat Evaluation/Offsite Mitigation Record
Systemwide	Anadromous Fish	Diagnosis Of 5 Pathogens
Systemwide	Anadromous Fish	Epidemiology And Control Of Infectious Diseases
Systemwide	Anadromous Fish	Pen Rearing And Imprinting Of Fall Chinook Salmon
Systemwide	Anadromous Fish	New Fish Tag System
Systemwide	Anadromous Fish	New Pit Tag Monitoring Equipment
Systemwide	Anadromous Fish	Columbia River Stock Assessment
Systemwide	Anadromous Fish	Low Cost Hatchery Facilities Design
Systemwide	Anadromous Fish	Develop Rations For Enhanced Survival Of Salmon
Systemwide	Anadromous Fish	Evaluate Low-Cost Salmon Production Facilities
Systemwide	Anadromous Fish	Survey Hatchery Production In Columbia Basin
Systemwide	Anadromous Fish	Investigate Process For Registration Of Squoxin
Systemwide	Anadromous Fish	Snake River Coho Brood Stock Program
Systemwide	Anadromous Fish	Columbia Chinook & Steelhead Stock Identification
Systemwide	Anadromous Fish	Water Budget Management
Systemwide	Anadromous Fish	Anadromous Fish Program Goals - Colville Tribe
Systemwide	Anadromous Fish	Anadromous Fish Program Goals - Spokane Tribe
Systemwide	Anadromous Fish	Anadromous Fish Program Goals - Nez Perce Tribe
Systemwide	Anadromous Fish	Anadromous Fish Program Goals - Yakima Tribe
Systemwide	Anadromous Fish	Anadromous Fish Program Goals - Warm Springs Tribe
Systemwide	Anadromous Fish	Anadromous Fish Program Goals - Umatilla Tribe
Systemwide	Anadromous Fish	Anadromous Fish Program Goals: Shoshone - Bannock
Systemwide	Anadromous Fish	Anadromous Fish Program Goals: Shoshone - Paiute
Systemwide	Anadromous Fish	Anadromous Fish Program Goal: Intertribe (CRITFC)
Systemwide	Anadromous Fish	Develop Nitrogen Gas Model (Gasspill)
Systemwide	Anadromous Fish	Smolt Monitoring At Federal Dams
Systemwide	Anadromous Fish	Fish Marking: Chinook And Steelhead (Idaho)
Systemwide	Anadromous Fish	Hydro-Cumulative Effects Methodology
Systemwide	Anadromous Fish	Adult Salmonid Accounting Procedures
Systemwide	Anadromous Fish	Evaluation Of A Subunit Vaccine Against Ihn
Systemwide	Anadromous Fish	Etiology Of Early Salmonid Lifestage Diseases
Systemwide	Anadromous Fish	Effect Of Nutrition On Immune Responses Of Salmon
Systemwide	Anadromous Fish	Develop Vaccine For Bacterial Kidney Disease -Bkd
Systemwide	Anadromous Fish	Quantify Loss Mitigation For Dam Operations
Systemwide	Anadromous Fish	Survey Of Artificial Salmon Production Facilities

Subbasin	Program	Title
Systemwide	Anadromous Fish	Workshop On Smoltification Research
Systemwide	Anadromous Fish	Influence Of Vitamin Nutrition On Immune Response
Systemwide	Anadromous Fish	Juvenile Radio Tag Studies
Systemwide	Anadromous Fish	Electrophoresis Demonstration Genetics Project
Systemwide	Anadromous Fish	Design Of Fish And Wildlife Mitigation Accounting
Systemwide	Anadromous Fish	Assist BPA Anadromous Fish Mitigation Analysis
Systemwide	Anadromous Fish	National Symposium - Small Hydro Plants & Fish
Systemwide	Anadromous Fish	Anadromous Fish Health Monitoring In Washington
Systemwide	Anadromous Fish	Anadromous Fish Health Monitoring (WDF)
Systemwide	Anadromous Fish	Downstream Migrant Monitoring
Systemwide	Anadromous Fish	Columbia Basin Habitat Improvement Evaluation
Systemwide	Anadromous Fish	Intertie Policy & Expansion Impacts (Fishpass)
Systemwide	Anadromous Fish	Facility Support For Bkd-Vaccine Testing
Systemwide	Anadromous Fish	Slide Show On Columbia Basin Habitat Enhancement
Systemwide	Anadromous Fish	Stream Habitat Enhancement Evaluation Workshop
Systemwide	Anadromous Fish	Alternative Fish Transportation Strategies
Systemwide	Anadromous Fish	Energy And Environmental Policy Intern Study
Systemwide	Anadromous Fish	Anadromous Fish Health Monitoring / Idaho
Systemwide	Anadromous Fish	Augmented Fish Health Monitoring / Oregon
Systemwide	Anadromous Fish	Augmented Fish Health Monitoring / USFWS
Systemwide	Anadromous Fish	Supplemental Oxygen Effectiveness Consultation
Systemwide	Anadromous Fish	Pit Tag Purchase Fy/87
Systemwide	Anadromous Fish	Non-Federal Smolt Monitoring (Fish Passage Center)
Systemwide	Anadromous Fish	Comparative Survival - Hatchery Pit Tagged Chinook
Systemwide	Anadromous Fish	Update Tensionsometer Equipment
Systemwide	Anadromous Fish	Freeze Brand Recovery Data (McNary Dam)
Systemwide	Anadromous Fish	Smolt And Adult A/V Monitoring Project
Systemwide	Anadromous Fish	Smolt Physiology - Travel Time And Survival
Systemwide	Anadromous Fish	Film BPA Fish Enhancement Activities In Idaho
Systemwide	Anadromous Fish	Literature Review Of Flow Fluctuations Effects
Systemwide	Anadromous Fish	Analysis Of Historic Data For Juveniles & Adult S
Systemwide	Anadromous Fish	Contractor For Water Budget Analysis
Systemwide	Anadromous Fish	Develop System For Removing Malachite Green
Systemwide	Anadromous Fish	Analyze Salmon & Steelhead Supplementation Efforts
Systemwide	Anadromous Fish	AFS Conference On Stream Habitat Rehabilitation
Systemwide	Anadromous Fish	Dworshak Photoperiod & Temperature Treatments
Systemwide	Anadromous Fish	Life Cycle Of IHN Virus
Systemwide	Anadromous Fish	Evaluation Of Oxygen Supplementation Equipment

Subbasin	Program	Title
Systemwide	Anadromous Fish	Effects Of Coded-Wire Tagging On Spring Chinook
Systemwide	Anadromous Fish	Elisa-Based Segregation Of Adult Chinook For Bkd
Systemwide	Anadromous Fish	Erythromycin Registration
Systemwide	Anadromous Fish	Analytical Methods For Malachite Green
Systemwide	Anadromous Fish	Assess Columbia Basin Anadromous Hatcheries
Systemwide	Anadromous Fish	Smolt Quality Assessment Of Spring Chinook
Systemwide	Anadromous Fish	Water Budget Technical Support
Systemwide	Anadromous Fish	Research On Anti-Fungal Compounds
Systemwide	Anadromous Fish	Annual Coded Wire Tag Program - USFWS Hatcheries
Systemwide	Anadromous Fish	Expand Coded Wire Tags - WA Columbia Hatcheries
Systemwide	Anadromous Fish	Expand Coded Wire Tags - Or Columbia Hatcheries
Systemwide	Anadromous Fish	Erythrocytic Inclusion Body Syndrome Etiology
Systemwide	Anadromous Fish	Modeling Optimized Hatchery Production
Systemwide	Anadromous Fish	Survey Of Salmon Cultural Research
Systemwide	Anadromous Fish	Genetic M&E Program For Salmon & Steelhead
Systemwide	Anadromous Fish	Epidemiological Salmonid Survival Studies
Systemwide	Anadromous Fish	Columbia River Salmon Passage (Crisp) Model
Systemwide	Anadromous Fish	Production Impacts Of Various Hatchery Stocks
Systemwide	Anadromous Fish	Fungal Infection: Spring And Summer Chinook Salmon
Systemwide	Anadromous Fish	Squawfish Management
Systemwide	Anadromous Fish	Squawfish Sport Rewards (PSMFC)
Systemwide	Anadromous Fish	Squawfish Management Evaluation
Systemwide	Anadromous Fish	Columbia Basin Pit-Tag Information System (Ptagis)
Systemwide	Anadromous Fish	Pit Tag Purchases
Systemwide	Anadromous Fish	Genetic Analyses Of Columbia & Snake Sockeye
Systemwide	Anadromous Fish	Evaluate & Implement Stream Habitat Improvements
Systemwide	Anadromous Fish	Snake Juvenile Wild Spring Chinook Mortality Study
Systemwide	Anadromous Fish	Elisa-Based Segregation Of Adult Chinook For Bkd
Systemwide	Anadromous Fish	Idaho Water Rental - Flows
Systemwide	Anadromous Fish	Evaluate River Flow Pertaining To Smolt Survival
Systemwide	Anadromous Fish	Genetic Consultation For BPA
Systemwide	Anadromous Fish	The Natures (Natural Rearing Enhancement Systems)
Systemwide	Anadromous Fish	Fish Habitat Project Field Reviews And Evaluations
Systemwide	Anadromous Fish	Rangeland Grazing Strategies Training Session
Systemwide	Anadromous Fish	Law Enforcement Protection Of Salmon Stocks
Systemwide	Anadromous Fish	Law Enforcement Protection- Salmon Stocks (CRITFC)
Systemwide	Anadromous Fish	Law Enforcement Protection Of Salmonids (Or)
Systemwide	Anadromous Fish	Law Enforcement Protection Of Salmonids (WDF)

Subbasin	Program	Title
Systemwide	Anadromous Fish	Law Enforcement Protection Of Salmonids (IDFG)
Systemwide	Anadromous Fish	Law Enforcement Interagency Task Force Coordin
Systemwide	Anadromous Fish	Law Enforcement Protection Of Salmonids (MTFW)
Systemwide	Anadromous Fish	Law Enforcement Transition Funding - Nez Perce
Systemwide	Anadromous Fish	Columbia Basin Regional Fish Screening
Systemwide	Anadromous Fish	Crisp.0 Model Development
Systemwide	Anadromous Fish	Fish Passage Evaluations - Lower Columbia River
Systemwide	Anadromous Fish	Integrated Hatchery Operations And Policy
Systemwide	Anadromous Fish	Passage, Spawning & Identity- Snake River Chinook
Systemwide	Anadromous Fish	Ecosystem Modeling For SOR/Afwg And Hybrid Crisp
Systemwide	Anadromous Fish	Hydropower Environmental Mitigation Study - Vol Ii
Systemwide	Anadromous Fish	Applications Of Sound To Modify Behavior Of Fish
Systemwide	Anadromous Fish	Tech Assistance Juv/Adult Migrant M&E Facilities
Systemwide	Anadromous Fish	Environmental Monitoring In The Snake River Basin
Systemwide	Anadromous Fish	Development Of Laser-Marking Of Salmonids
Systemwide	Anadromous Fish	Idaho Fish Screen Shop
Systemwide	Anadromous Fish	1992 Watershed Symposium
Systemwide	Anadromous Fish	Streamwalk Training
Systemwide	Anadromous Fish	E Washington Landowners Adopt-A-Stream Training
Systemwide	Anadromous Fish	Allowable Gas Supersaturation At Dams
Systemwide	Anadromous Fish	Non-Intrusive Gbd Monitoring Technologies
Systemwide	Anadromous Fish	Signs Of Gas Bubble Trauma (Gbd) In Salmonids
Systemwide	Anadromous Fish	Adult Upstream Survival - Biological Analysis
Systemwide	Anadromous Fish	Development And Implementation Of Harvest Projects
Systemwide	Anadromous Fish	Smolt Survival Estimates Through Dams & Reservoirs
Systemwide	Anadromous Fish	Technical Assistance With The Life Cycle Model
Systemwide	Anadromous Fish	Flow Volume Provisions / Support
Systemwide	Anadromous Fish	Water Acquisition Pilot Project
Systemwide	Anadromous Fish	Water Purchase Acquisition/Lease Fee/Purchase Opt
Systemwide	Anadromous Fish	Captive Salmonid Broodstock Technology Demo
Systemwide	Anadromous Fish	Comprehensive Analysis Of Salmonid Production
Systemwide	Anadromous Fish	Electrophoretic Analysis Of Snake River Sockeye
Systemwide	Anadromous Fish	Fish Passage Center
Systemwide	Anadromous Fish	Columbia Basin Ecosystem Management
Systemwide	Anadromous Fish	Audit Columbia Basin Anadromous Hatcheries (Ihot)
Systemwide	Anadromous Fish	Joint Culture Facility Scientific Review
Systemwide	Anadromous Fish	Reservoir Operations Committee Facilitator
Systemwide	Anadromous Fish	Path - Facilitation, Tech Assistance & Peer Review

Subbasin	Program	Title
Systemwide	Anadromous Fish	Path Transition Placeholder
Subbasin	Program	Title
Systemwide	Anadromous Fish	Path - Participation By State And Tribal Agencies
Systemwide	Anadromous Fish	Technical Support For Path - NMFS Staff
Systemwide	Anadromous Fish	Path - Participation By USFWS
Systemwide	Anadromous Fish	Review Proposed Projects & Gas Bubble Trauma
Systemwide	Anadromous Fish	Technical Support For The Path Process
Systemwide	Anadromous Fish	Pit Tagging Hatchery Spring/Summer Chinook - WDFW
Systemwide	Anadromous Fish	Pit Tagging Hatchery Spring/Summer Chinook - ODFW
Systemwide	Anadromous Fish	Pit Tagging Hatchery Spring/Summer Chinook - IDFG
Systemwide	Anadromous Fish	Pit Tagging Hatchery Spring/Summer Chinook - USF&W
Systemwide	Anadromous Fish	Gas Bubble Disease Research On Juvenile Salmonids
Systemwide	Anadromous Fish	Effects Of Dissolved Gas Supersat On Resident Fish
Systemwide	Anadromous Fish	Gas Bubble Disease Signs & Survival Of Smolts
Systemwide	Anadromous Fish	Salmonid Cumulative Exposure To Dissolved Gas
Systemwide	Anadromous Fish	Distribution Of Smolts & Gas Bubble Disease
Systemwide	Anadromous Fish	Manchester Spring Chinook Captive Brood
Systemwide	Anadromous Fish	Five Year Plan Watersheds (CRITFC)
Systemwide	Anadromous Fish	NEPA Studies For Model Watershed Projects
Systemwide	Anadromous Fish	NEPA - Watershed Management Program EIS
Systemwide	Anadromous Fish	Path Program Technical Support (UW)
Systemwide	Anadromous Fish	Incidental Expenses - Gas Bubble Disease Research
Systemwide	Anadromous Fish	Evaluation & Habitat Response To Recent Storms
Systemwide	Anadromous Fish	Hydro Regulator Model Development
Systemwide	Anadromous Fish	Peer Review For CRITFC Watershed Projects - 1
Systemwide	Anadromous Fish	Peer Review For CRITFC Watershed Projects -2
Systemwide	Anadromous Fish	Peer Review For CRITFC Watershed Projects -3
Systemwide	Anadromous Fish	Assess Impacts Of Hydro Dev On Mainstem Habitats
Systemwide	Anadromous Fish	Assess Population In Columbia River Chinook Salmon
Systemwide	Anadromous Fish	Review Columbia Basin Artificial Production
Systemwide	Anadromous Fish	Technical Support To Path (Dr. James Anderson)
Systemwide	Anadromous Fish	Analytical Support - Dr James Anderson
Systemwide	Anadromous Fish	Design/Construction Services Contractor Pool
Systemwide	Anadromous Fish	Tech Writer Sockeye/Chinook Oversight Committee
Systemwide	Anadromous Fish	Implement Wy-Kan-Ush-Mi Wa-Kish-Wit Watershed Plan
Systemwide	Anadromous Fish	Effect Of Grazing Exclosures On Stream Habitat
Systemwide	Anadromous Fish	Watershed Response Of Stream Habitat To Mine Waste

Subbasin	Program	Title
Systemwide	Anadromous Fish	Info-Artificial Production Mitigation Col R Basin
Systemwide	Anadromous Fish	NMFS Net Exchange Program
Systemwide	Anadromous Fish	Gillnet Mesh Selectivity Study
Systemwide	Anadromous Fish	Mesh Restriction Survey/Enhanced Law Enforcement
Systemwide	Anadromous Fish	NRCS Rosgen Training Support
Systemwide	Anadromous Fish	Nutrient Impact On Salmon Prod In Columbia R Basin
Systemwide	Anadromous Fish	Nutrient Use From Spawning Salmon By Juv Salmon
Systemwide	Anadromous Fish	Analytical Modeling Support - NMFS
Systemwide	Anadromous Fish	Training Support To NRCS/Wildland Hydrology
Systemwide	Anadromous Fish	Infrastructure For Fda Registration Erythromycin
Systemwide	Anadromous Fish	Recondition Wild Steelhead Kelts
Systemwide	Anadromous Fish	Law Enforcement Anadromous Salmonids In Mainstem
Systemwide	Anadromous Fish	Evaluate Hydraulic Turbulence On Migratory Fish
Systemwide	Anadromous Fish	Supersaturated Water Effect On Adult Salmonids
Systemwide	Anadromous Fish	Meadow Creek Riparian Pasture
Systemwide	Anadromous Fish	Conservation Reserve Enhancement Program Incentive
Systemwide	Anadromous Fish	Analyze Genetic & Behavioral Change Domestication
Systemwide	Anadromous Fish	Heritability Disease Resistance & Immune Function
Systemwide	Program Coordination	Fish And Wildlife Program Implementation
Systemwide	Program Coordination	Pacific Northwest Rivers Study, Develop Ned
Systemwide	Program Coordination	Formalize Procedures For Proposal Evaluations
Systemwide	Program Coordination	Technical Assistance For Fish & Wildlife Projects
Systemwide	Program Coordination	Annual Project Review
Systemwide	Program Coordination	Develop Contract Data Information System (Pmis)
Systemwide	Program Coordination	Clerk-Typist Services
Systemwide	Program Coordination	Clerk-Typist Contracts
Systemwide	Program Coordination	Facility Rental - Spokane Holiday Inn
Systemwide	Program Coordination	Facility Rental (Holiday Inn) For Project Review
Systemwide	Program Coordination	Facilitator For Annual Project Review Fy86
Systemwide	Program Coordination	Newsclips On Various BPA Fish & Wildlife Projects
Systemwide	Program Coordination	Technical Assistance- BPA Fish & Wildlife Program
Systemwide	Program Coordination	Fund (Twg) Technical Work Group- Research Emphasis
Systemwide	Program Coordination	Technical Assistance For BPA Fish & Wildlife
Systemwide	Program Coordination	Maintain Coordinated Information System (Cis)
Systemwide	Program Coordination	BPA- Coordinated Information System (USGS Mapping)
Systemwide	Program Coordination	Develop & Maintain Streamnet By Merger Of Cis /Ned
Systemwide	Program Coordination	BPA - Fish & Wildlife Program Internal Support
Systemwide	Program Coordination	Afs Bioengineering Symposium

Subbasin	Program	Title
Systemwide	Program Coordination	Parking Space For BPA Office At Yakima
Systemwide	Program Coordination	Workshop For Fish Survival
Systemwide	Program Coordination	Cbfga Coordination. & Scientific Review Group
Systemwide	Program Coordination	Annual Work Plan - Columbia Basin F&W Foundation
Systemwide	Program Coordination	Scientific Review Group Support - Doe
Systemwide	Program Coordination	Scientific Review Group Meeting Facilities
Systemwide	Program Coordination	Participation In Analytical Methods Coordination
Systemwide	Program Coordination	Analytical Methods Coordination - ODFW
Systemwide	Program Coordination	Analytical Methods Coordination - IDFG
Systemwide	Program Coordination	Analytical Methods Coordination - WDF
Systemwide	Program Coordination	Analytical Methods Coordination - PSMFC
Systemwide	Program Coordination	Division Retreat Meeting Facilities
Systemwide	Program Coordination	Consultant For ESA, SOR, & Other Concerns
Systemwide	Program Coordination	Write &Edit BPA's Comments- Integrated System Plan
Systemwide	Program Coordination	Program Support - Offsite Room Rentals
Systemwide	Program Coordination	CBFWA F&W Program Planning And Coordination
Systemwide	Program Coordination	Support For Habitat Education Activities
Systemwide	Program Coordination	Fish And Wildlife Public Education Project
Systemwide	Program Coordination	BPA Fish & Wildlife Internet Infrastructure
Systemwide	Program Coordination	PSMFC Educational Publications
Systemwide	Program Coordination	Watershed Education Interactive Display For OMSI
Systemwide	Program Coordination	Regional Habitat Education Support
Systemwide	Program Coordination	Technical Support For Variety Of Biological Issues
Systemwide	Program Coordination	Electronic Reference Library
Systemwide	Program Coordination	Cultural, Social, Institutional Impacts Of ESA
Systemwide	Program Coordination	Regional Analytical Coordination Group
Systemwide	Program Coordination	Native American Science Outreach Network Students
Systemwide	Program Coordination	F&W Newsletter Development Grant
Systemwide	Program Coordination	Energy Newsdata Demonstration Project (Fish.Net)
Systemwide	Program Coordination	BPA Technical Management Team Database Support
Systemwide	Program Coordination	Alternative Dispute Resolution Funding
Systemwide	Program Coordination	NEPA Studies For A Variety Of Projects: Or, Wa, Id
Systemwide	Program Coordination	Independent Scientific Review Panel
Systemwide	Program Coordination	Analytic Support Path/ESA Biology Assessment
Systemwide	Program Coordination	Electronic Fish And Wildlife Newsletter
Systemwide	Program Coordination	Assess Hydro And Habitat Impacts - USGS
Systemwide	Program Coordination	Regional Forum Facilitator
Systemwide	Program Coordination	Natural Heritage Program (NHP)

Subbasin	Program	Title
Systemwide	Program Coordination	Geographic Information System(GIS) Program
Systemwide	Program Coordination	Writer - Editor For ESA Meetings
Systemwide	Program Coordination	USF&WS Wildlife Coordination
Systemwide	Program Coordination	Multispecies Framework Process
Systemwide	Program Coordination	Redesign Of F&W Management Systems
Systemwide	Program Coordination	Washington Natural Heritage Information System
Systemwide	Program Coordination	Project Management Plan Templates
Systemwide	Program Coordination	Salmon Watch Program
Systemwide	Program Coordination	Capital Cost Review And Monitoring
Systemwide	Program Coordination	Habitat Concept Plan
Systemwide	Program Coordination	Federal Caucus/Unified Plan
Systemwide	Program Coordination	Hatchery & Harvest Project For The Federal Caucus
Systemwide	Program Coordination	Brian Blair - Watershed Coordinators Meeting
Systemwide	Program Coordination	Pacific Northwest National Laboratory
Systemwide	Program Coordination	NW Fishweb Online Guide
Systemwide	Program Coordination	Technical Services: Performance Measures
Systemwide	Program Coordination	Technical Support Project Placeholder
Systemwide	Program Coordination	Capital Placeholder Per NWPPC Guidance
Systemwide	Program Coordination	BPA Technical Support Placeholder
Systemwide	Program Coordination	CBFWA Placeholder
Systemwide	Program Coordination	Innovative Projects Placeholder
Systemwide	Program Coordination	Sub Basin Planning Placeholder
Systemwide	Program Coordination	Program Analysis Placeholder
Systemwide	Program Coordination	Subbasin Assessments
Systemwide	Program Coordination	Baseline Key Ecological Functions - NHI
Systemwide	Program Coordination	Baseline Key Ecological Functions - WDF&W
Systemwide	Program Coordination	Analytical Support For BPA
Systemwide	Resident Fish	Implementation Plan For MT Resident Fish Measures
Systemwide	Resident Fish	White Sturgeon Workshop
Systemwide	Resident Fish	Columbia River White Sturgeon Study
Systemwide	Resident Fish	Develop Work Plan For Sturgeon Research
Systemwide	Resident Fish	Evaluate Sturgeon Habitat Needs - Columbia & Snake
Systemwide	Resident Fish	White Sturgeon Life History And Genetics Study
Systemwide	Resident Fish	Document Native Wa Trout Populations
Systemwide	Resident Fish	Bull Trout Biological Assessment
Systemwide	Resident Fish	Assess Genetics Of Columbia Basin White Sturgeon
Systemwide	Wildlife	Columbia Basin Wildlife Mitigation Status Report
Systemwide	Wildlife	Montana Wildlife Habitat Protection

Subbasin	Program	Title
Systemwide	Wildlife	Montana Wildlife Trust
Systemwide	Wildlife	Lower Columbia Wildlife Mitigation Plan
Systemwide	Wildlife	Oregon Wildlife Trust Program Planning
Systemwide	Wildlife	Washington Coalition Wildlife Mitigation Agreement
Systemwide	Wildlife	Washington Wildlife Coordination
Systemwide	Wildlife	Umatilla Tribe Wildlife Coordination
Systemwide	Wildlife	Gap Analysis - ODFW
Systemwide	Wildlife	Wildlife Acquisition EIS
Systemwide	Wildlife	Oregon Wildlife Mitigation Sites
Systemwide	Wildlife	Oregon Wildlife Mitigation Sites - USFWS
Systemwide	Wildlife	Oregon Wildlife Mitigation Sites -Ctwsir
Systemwide	Wildlife	Oregon Wildlife Mitigation Sites - ODFW
Systemwide	Wildlife	Wildlife Plan: Standardize M & E
Systemwide	Wildlife	Wildlife Mitigation M & E
Systemwide	Wildlife	HEP Training
Crab Creek	Resident Fish	Assessment Of Fishery Improvement At Moses Lake
Crab Creek	Wildlife	Swanson Lakes Sharp Tailed Grouse Management
Crab Creek	Wildlife	Range Management -Swanson Lake Sharp-Tailed Grouse
Crab Creek	Wildlife	Razor Ranch Acquisition Crab Cr Ws Restoration
Yakima	Anadromous Fish	Yakima River Spring Chinook Enhancement Study
Yakima	Anadromous Fish	Predesign Screen / Ladder Studies, Yakima Basin
Yakima	Anadromous Fish	Estimated Screen Costs: Sunnyside And Wapato Dams
Yakima	Anadromous Fish	Fish Marking: Steelhead - Yakima Basin
Yakima	Anadromous Fish	Final Design Data For Sunnyside Dam Screens
Yakima	Anadromous Fish	Final Design- Sunnyside, Wapato, Richland Passage
Yakima	Anadromous Fish	Predesign Of Remaining 10 Yakima Screen Projects
Yakima	Anadromous Fish	Sunnyside Screens Construction
Yakima	Anadromous Fish	Horn Rapids Screen Construction
Yakima	Anadromous Fish	Wapato Screen And Ladder Construction
Yakima	Anadromous Fish	Toppenish Creek And Satus Unit Screens And Ladder
Yakima	Anadromous Fish	Horn Rapids Screen Construction
Yakima	Anadromous Fish	Improve Sunnyside Ladders And Screen
Yakima	Anadromous Fish	Evaluation Of Yakima Passage Improvements
Yakima	Anadromous Fish	Temporary Fish Passage On Toppenish Creek
Yakima	Anadromous Fish	Construct Security Fence - Sunnyside Right Bank
Yakima	Anadromous Fish	Cle Elum Lake Basin Sockeye Study
Yakima	Anadromous Fish	Construct Westside & Marion Drain Screen & Ladder
Yakima	Anadromous Fish	Little Naches Passage Improvement - Salmon Falls

Subbasin	Program	Title
Yakima	Anadromous Fish	Satus Creek Screen & Ladder Construction
Yakima	Anadromous Fish	Upper Toppenish Creek Screen Construction
Yakima	Anadromous Fish	Yakima Passage Predesign - Remaining Phase I Sites
Yakima	Anadromous Fish	Video Of Yakima Fish Passage Project
Yakima	Anadromous Fish	Construct Toppenish, Westside & Ellensburg Screens
Yakima	Anadromous Fish	Ellensburg Fish Screens Construction
Yakima	Anadromous Fish	Westside Ditch Screen Construction
Yakima	Anadromous Fish	Marion Drain Ladder Construction
Yakima	Anadromous Fish	Purchase Plaques -Audio/Visual Support Project
Yakima	Anadromous Fish	Yakima Fishery Film
Yakima	Anadromous Fish	Video Of Yakima Phase II Screen Project
Yakima	Anadromous Fish	Yakima Hatchery - Master Plan Development
Yakima	Anadromous Fish	Yakima Hatchery - Wapato Canal Pen Rearing
Yakima	Anadromous Fish	Film Yakima Fish Screen And Ladder Projects
Yakima	Anadromous Fish	Yakima Hatchery - Construction
Yakima	Anadromous Fish	Yakima Hatchery Acclimation Sites Groundwater
Yakima	Anadromous Fish	Yakima Hatchery - Cle Elum Well Field Development
Yakima	Anadromous Fish	Yakima Hatchery - Wells Ce5/Ce6 (Land Purchase)
Yakima	Anadromous Fish	Clark Flat Acclimation Site - Yakima Hatchery
Yakima	Anadromous Fish	Easton Acclimation Site - Yakima Hatchery
Yakima	Anadromous Fish	Jack Creek Acclimation Site - Yakima Hatchery
Yakima	Anadromous Fish	Yakima Hatchery Spring Chinook Acclimation Sites
Yakima	Anadromous Fish	Yakima Hatchery - Acclimation Site Construction
Yakima	Anadromous Fish	Yakima Hatchery Construction-River Water Cooling
Yakima	Anadromous Fish	Yakima Hatchery Construction-Housing Units Phase 2
Yakima	Anadromous Fish	YKFP - Design And Construction
Yakima	Anadromous Fish	Yakima Natural Production And Enhancement Program
Yakima	Anadromous Fish	Yakima/ Klickitat Fisheries Project Management
Yakima	Anadromous Fish	Yakima Engineer Assistance
Yakima	Anadromous Fish	Tribal Member For Yakima Species Interaction Study
Yakima	Anadromous Fish	Yakima Hatchery Training And Education
Yakima	Anadromous Fish	Yakima Fish Passage Video Monitoring
Yakima	Anadromous Fish	Yakima Tribal Fisheries Technicians (1993)
Yakima	Anadromous Fish	Yakima Spring Chinook Natural Production Objective
Yakima	Anadromous Fish	Yakama Tribal Fisheries Technician Activities
Yakima	Anadromous Fish	Yakima Steelhead & Fall Chinook Objectives
Yakima	Anadromous Fish	Chandler Juvenile Facility Monitoring & Evaluation
Yakima	Anadromous Fish	Monitoring & Evaluation-Yakima/Klickitat Fisheries

Subbasin	Program	Title
Yakima	Anadromous Fish	Interim O&M For Cle Elum (Yakima) Hatchery
Yakima	Anadromous Fish	YKFP - Management Data And Habitat
Yakima	Anadromous Fish	Yin Hatchery Training And Education
Yakima	Anadromous Fish	Yakima Hatchery - Coordination Irrigation District
Yakima	Anadromous Fish	Yakima Hatchery - Basin Water Analysis
Yakima	Anadromous Fish	Yakima Hatchery - Economic Study
Yakima	Anadromous Fish	Yakima Hatchery - Preliminary Engineering
Yakima	Anadromous Fish	Yakima Hatchery - Experimental Design - WDF
Yakima	Anadromous Fish	Yakima Hatchery - Experimental Design - WDW
Yakima	Anadromous Fish	Yakima/ Klickitat Salmonid Radio Telemetry Study
Yakima	Anadromous Fish	Yakima Phase Ii Screens - Pre-design Group I
Yakima	Anadromous Fish	Yakima Hatchery - Environmental Assessment Review
Yakima	Anadromous Fish	Yakima - Species Interaction Study
Yakima	Anadromous Fish	Yakima Hatchery - Project Leader Function
Yakima	Anadromous Fish	Chandler Juvenile Trap Calibration
Yakima	Anadromous Fish	Yakima Hatchery - Final Design
Yakima	Anadromous Fish	Technical Design For Yakima Salmon/Steelhead Prod
Yakima	Anadromous Fish	Yakima Hatchery Final Design/Well Field Development
Yakima	Anadromous Fish	Yakima Hatchery Final Design/Instrumentation/Serv
Yakima	Anadromous Fish	Yakima Hatchery Final Design/Acclimation Permits
Yakima	Anadromous Fish	Yakima Hatchery Final Design Acclimation Sites
Yakima	Anadromous Fish	Yakima Adult And Juvenile Trapping Design
Yakima	Anadromous Fish	Evaluate Impacts Of Yakima Production Project
Yakima	Anadromous Fish	Yakima Phase Ii Screens - Fabrication
Yakima	Anadromous Fish	Inventory Habitat & Food Abundance Data
Yakima	Anadromous Fish	Yakima Phase Ii Screens - Construction
Yakima	Anadromous Fish	Yakima Screens - Fogarty Land Acquisition
Yakima	Anadromous Fish	Yakima Screens - Moxee Hubbard Land Acquisition
Yakima	Anadromous Fish	Yakima Screens - Selah Moxee Land Acquisition
Yakima	Anadromous Fish	South Naches Fish Screens Land Acquisition
Yakima	Anadromous Fish	Yakima Screens - Phase Ii - O & M
Yakima	Anadromous Fish	Assistance For Yakima Supplementation Research
Yakima	Anadromous Fish	Assistance For Yakima M&E Program Development
Yakima	Anadromous Fish	Yakima Experimental Design Development
Yakima	Anadromous Fish	Wild Smolt Behavior And Physiology
Yakima	Anadromous Fish	Cascade Irrigation District Fish Screens
Yakima	Anadromous Fish	Bachelor-Hatten Fish Passage Land Acquisition
Yakima	Anadromous Fish	Yakima Biospecification Interface

Subbasin	Program	Title
Yakima	Anadromous Fish	Economic Impact Analysis For Yakima River Basin
Yakima	Anadromous Fish	Production Goals: Yakima Fall Chinook & Steelhead
Yakima	Anadromous Fish	Yakima Basin Fish Facilities O&M
Yakima	Anadromous Fish	Update Yakima Fisheries Project Economic Analysis
Yakima	Anadromous Fish	Yakima / Klickitat Fisheries Management
Yakima	Anadromous Fish	Yakima/Klickitat Monitoring And Evaluation Program
Yakima	Anadromous Fish	Chandler Juvenile Facility O&M
Yakima	Anadromous Fish	Lower Yakima River Predation Studies
Yakima	Anadromous Fish	Yakima Hatchery Fish Predation On Wild Smolts
Yakima	Anadromous Fish	Yakima Data Processing & Information Management
Yakima	Anadromous Fish	YKFP - Yakima / Klickitat Fisheries M & E
Yakima	Anadromous Fish	Yakima/ Klickitat Fisheries Scientific Management
Yakima	Anadromous Fish	Refinement Of Marking Methods For Yakima Fish
Yakima	Anadromous Fish	Upper Yakima River Species Interaction Studies
Yakima	Anadromous Fish	Yakima Spring Chinook Genetic Management Framework
Yakima	Anadromous Fish	Yakima Policy / Technical Involvement & Planning
Yakima	Anadromous Fish	Developing Nit/Lnit Rearing Strategies For Yakima
Yakima	Anadromous Fish	Monitoring Supplemental Response - Yakima Project
Yakima	Anadromous Fish	Roza Dam Juvenile Guidance Behavior -WDFW
Yakima	Anadromous Fish	YKRP Development Of Bird Predation Index -WDFW
Yakima	Anadromous Fish	Yakima Spring Chinook Salmon Interaction/Indices
Yakima	Anadromous Fish	Genetic Pathogens Of Yakima Spring Chinook (WDFW)
Yakima	Anadromous Fish	WDFW Coded-Wire Tag Of Upper Yakima Spring Chinook
Yakima	Anadromous Fish	WDFW/YKFP Supplementation Monitoring Activities
Yakima	Anadromous Fish	Policy/Technical Involvement And Planning For YKFP
Yakima	Anadromous Fish	Purchase Land At Cle Elum For The Yakima Hatchery
Yakima	Anadromous Fish	Yakama Tribe: Early Implementation Projects 1996
Yakima	Anadromous Fish	Yakima River & Marion Drain Fall Chinook Project
Yakima	Anadromous Fish	Yakima River Coho Restoration (Yn)
Yakima	Anadromous Fish	Fall Chinook Yakima River / Marion Drain O&M / M&E
Yakima	Anadromous Fish	Fall Chinook Yakima R/Marion Drain Construction
Yakima	Anadromous Fish	Yn - Coho Supplementation Yakima River O&M/M&E
Yakima	Anadromous Fish	Yn - Coho Supplementation - Yakima R Construction
Yakima	Anadromous Fish	YKFP O&M For Yakima River Fall Chinook And Coho
Yakima	Anadromous Fish	Yakima Indian Nation Watershed Restoration
Yakima	Anadromous Fish	Yakima Watershed Restoration - Satus Creek - Yin
Yakima	Anadromous Fish	Yakima Watershed Restoration - Wilson Creek
Yakima	Anadromous Fish	Materials/Supplies- Yakama Early Action Watershed

Subbasin	Program	Title
Yakima	Anadromous Fish	NEPA For Upper Wapato Irrigation Project
Yakima	Anadromous Fish	Yakima Cle Elum Hatchery O & M
Yakima	Anadromous Fish	YKFP - Operations And Maintenance
Yakima	Anadromous Fish	Yakima River Side Channel Survey & Rehabilitation
Yakima	Anadromous Fish	Teanaway River Instream Flow Restoration - BOR
Yakima	Anadromous Fish	Teanaway River Instream Flow Restoration - NRCS
Yakima	Anadromous Fish	Teanaway River Instream Flow Restoration - Kccd
Yakima	Anadromous Fish	Little Naches Riparian And Channel Enhancement
Yakima	Anadromous Fish	Yakima River Side Channels
Yakima	Anadromous Fish	Yakima Habitat Enhancement - Selah/Union Gap
Yakima	Anadromous Fish	Toppenish/Simcoe Instream Flow Restoration
Yakima	Anadromous Fish	Develop Yakima Natural Production Objectives
Yakima	Anadromous Fish	Upper Toppenish Creek Watershed Restoration
Yakima	Anadromous Fish	Establish Safe Access Tributaries -Yakima Subbasin
Yakima	Anadromous Fish	Coordinate Watershed Planning & Implementation
Yakima	Anadromous Fish	Ahtanum Creek Watershed Assessment
Yakima	Anadromous Fish	Yakima Basin Benthic Index Of Biotic Integrity
Yakima	Program Coordination	Off-Site Clerical Services - Yakima Project
Yakima	Program Coordination	Yakima Resource Newsletter
Yakima	Program Coordination	Environmental Awareness Project - Yakima Schools
Yakima	Program Coordination	Yakima Basin Environmental Education
Yakima	Program Coordination	Nelson Springs BPA Facility Janitorial Service
Yakima	Program Coordination	Educate/Support Yakima River Basin Groups
Yakima	Wildlife	Lower Yakima Valley Riparian/Wetlands - Phase I
Rock Creek	Anadromous Fish	Rock Creek Watershed Assessment & Restoration
Deschutes	Anadromous Fish	Baseline Information For Warm Springs Reservation
Deschutes	Anadromous Fish	Warm Springs Habitat / Production Assessment
Deschutes	Anadromous Fish	Deschutes River Spawning Gravel Study
Deschutes	Anadromous Fish	Trout Creek Habitat Enhancement Plan
Deschutes	Anadromous Fish	White River Falls Passage Study
Deschutes	Anadromous Fish	Coordination Of Trout Creek Restoration
Deschutes	Anadromous Fish	Implementation Of Trout Creek Habitat Restoration
Deschutes	Anadromous Fish	White River Falls Fish Passage Impact Study
Deschutes	Anadromous Fish	Trout Creek Benefit Cost Analysis Refinement
Deschutes	Anadromous Fish	Trout Creek Photomosaics & Benefit/Cost Analysis
Deschutes	Anadromous Fish	Trout Creek Presentation At BPA Project Review
Deschutes	Anadromous Fish	Produce Unified Trout Creek Project Report
Deschutes	Anadromous Fish	Hood River Production Program - Hatchery O&M

Subbasin	Program	Title
Deschutes	Anadromous Fish	Hood River - Powerdale/Oak Springs O&M - ODFW
Deschutes	Anadromous Fish	Pelton Dam Ladder Production
Deschutes	Anadromous Fish	Oak Springs Hatchery Modifications For Hood River
Deschutes	Anadromous Fish	Buck Hollow Watershed Enhancement (Swcd)
Deschutes	Anadromous Fish	Buck Hollow Watershed Enhancement (ODFW)
Deschutes	Anadromous Fish	Trout Creek Operation & Maintenance
Deschutes	Anadromous Fish	Warm Springs Habitat Enhancement And O&M
Deschutes	Anadromous Fish	Habitat & Passage Projects - Warm Springs Tribe
Deschutes	Anadromous Fish	Ctwsir Materials & Supplies: Watershed Projects
Deschutes	Anadromous Fish	Early Action Cooperative Funding Agreement - Ctwir
Deschutes	Anadromous Fish	Warm Springs River Stream Survey
Deschutes	Anadromous Fish	Warm Springs Reservation Watershed Enhancement
Deschutes	Anadromous Fish	Warm Springs Watershed Restoration Mat & Supplies
Deschutes	Anadromous Fish	Warm Springs Watershed Materials & Supplies #2
Deschutes	Anadromous Fish	Implement Trout Creek Watershed Enhancement
Deschutes	Anadromous Fish	Trout Cr Irrigation System Replacement-Willowdale2
Deschutes	Anadromous Fish	Middle Deschutes Watershed Coordination
Deschutes	Anadromous Fish	Bakeoven Riparian Assessment
Deschutes	Anadromous Fish	Warm Springs Reservation Watershed Enhancement
Deschutes	Resident Fish	Bull Trout Life History Project - NE Oregon
Deschutes	Resident Fish	Warm Springs Tribe Crayfish Study
John Day	Anadromous Fish	John Day River Wild Spring Chinook Study
John Day	Anadromous Fish	John Day River Habitat Improvement
John Day	Anadromous Fish	Murderers / Deer Creeks Habitat Improvement
John Day	Anadromous Fish	Clear / Granite Creeks Habitat Improvement
John Day	Anadromous Fish	North Fork John Day Habitat Improvement
John Day	Anadromous Fish	Cottonwood Creek Habitat Improvement
John Day	Anadromous Fish	North Fork John Day Habitat Improvement
John Day	Anadromous Fish	Mainstem & Middle Fork John Day Habitat Work
John Day	Anadromous Fish	Mainstem & Upper John Day Habitat Improvement
John Day	Anadromous Fish	South Fork John Day & Mainstem Habitat Improvement
John Day	Anadromous Fish	North Fork John Day Fish Habitat Enhancement
John Day	Anadromous Fish	Oregon Fish Screens Project
John Day	Anadromous Fish	Clear Cr & NF John Day Dredge-Tailings Restoration
John Day	Anadromous Fish	Monitoring Fine Sediment-Grande Ronde & John Day R
John Day	Anadromous Fish	Escapement /Productivity Spring Chinook - John Day
John Day	Anadromous Fish	Gravel Push-Up Dam Removal Lower N Fk John Day R
John Day	Anadromous Fish	Irrigation & Riparian Improvements - John Day R

Subbasin	Program	Title
John Day	Anadromous Fish	Pine Hollow Watershed Enhancement
John Day	Anadromous Fish	Acquire Oxbow Ranch Middle Fork John Day River
John Day	Anadromous Fish	Enhance North Fork John Day River Subbasin - CTUIR
John Day	Anadromous Fish	Upstream Migration Pacific Lampreys John Day River
John Day	Wildlife	Acquisition Of Pine Creek Ranch
Lower Mid-Columbia	Anadromous Fish	John Day Reservoir Requirements For Chinook Salmon
Lower Mid-Columbia	Anadromous Fish	Evaluate Salmonid Outmigration At McNary Dam
Lower Mid-Columbia	Anadromous Fish	Smolt Passage Behavior And Flow Relationships
Lower Mid-Columbia	Anadromous Fish	Radio Tracking Of Chinook - Bonneville To McNary
Lower Mid-Columbia	Anadromous Fish	Priest Rapids Summer Migration Monitoring
Lower Mid-Columbia	Anadromous Fish	Water Budget Management Positions
Lower Mid-Columbia	Anadromous Fish	Smolt Monitoring -Lower Monumental & Dalles Dams
Lower Mid-Columbia	Anadromous Fish	Acclimation Pond Search Above John Day Dam
Lower Mid-Columbia	Anadromous Fish	McNary Dam Juvenile Fish Collection Efficiency
Lower Mid-Columbia	Anadromous Fish	Post Release Survival Of Fall Chinook In Snake R
Lower Mid-Columbia	Anadromous Fish	Lower Columbia Fish Passage Evaluations
Lower Mid-Columbia	Anadromous Fish	Ringold Hatchery Water Supply
Lower Mid-Columbia	Anadromous Fish	Vernita Bar Redd Surveys
Lower Mid-Columbia	Anadromous Fish	Spawning Habitat Model - Snake River Fall Chinook
Lower Mid-Columbia	Anadromous Fish	John Day Dam Smolt Monitoring Facility
Lower Mid-Columbia	Anadromous Fish	K-Basin (Hanford Reach) Acclimation/ Propagation
Lower Mid-Columbia	Anadromous Fish	Hanford K-Basin Fall Chinook Acclimation (Yn)
Lower Mid-Columbia	Anadromous Fish	Hanford Reach K-Basin Master Plan (Yn)
Lower Mid-Columbia	Anadromous Fish	Hanford K-Basin Fall Chinook Rearing/Tagging
Lower Mid-Columbia	Anadromous Fish	Pit Tag System Improvements
Lower Mid-Columbia	Anadromous Fish	Evaluate Smolt Stranding In Hanford Reach
Lower Mid-Columbia	Anadromous Fish	McNary And Walla Walla Operations And Maintenance
Lower Mid-Columbia	Anadromous Fish	Hanford Reach Steelhead Stock Investigation
Lower Mid-Columbia	Anadromous Fish	Diet,Dist,History Of N. Mercedis In John Day Pool
Lower Mid-Columbia	Resident Fish	Film John Day Sturgeon Activities
Lower Mid-Columbia	Wildlife	Bonneville Dam Wildlife Loss Study
Lower Mid-Columbia	Wildlife	Lower Columbia Hydroprojects Wildlife Losses
Lower Mid-Columbia	Wildlife	Wanaket Wildlife Area (Conforth Ranch) Management
Lower Mid-Columbia	Wildlife	Conforth Ranch Land Purchase
Lower Mid-Columbia	Wildlife	Conforth Ranch Road Repair
Lower Mid-Columbia	Wildlife	Conforth Ranch - Hazardous Waste Disposal
Lower Mid-Columbia	Wildlife	Conforth Ranch: Clean Generator
Lower Mid-Columbia	Wildlife	Crate's Point Grounds Improvements

Subbasin	Program	Title
Lower Mid-Columbia	Wildlife	Wildlife Mitigation Sites Oregon, Irrigon Addition
Lower Mid-Columbia	Wildlife	Wildlife Mitigation Sites Oregon, Horn Butte
Lower Mid-Columbia	Wildlife	Eagle Lakes Ranch Acquisition And Restoration
Lower Snake	Anadromous Fish	Snake River Radio Tracking Of Chinook & Steelhead
Lower Snake	Anadromous Fish	Monitor Smolt Arrival At Lower Granite Dam
Lower Snake	Anadromous Fish	Evaluate Bypass Conduit Designs - Lower Snake Dams
Lower Snake	Anadromous Fish	Freeze Brand Salmonids At Lyons Ferry Hatchery
Lower Snake	Anadromous Fish	Lower Granite Pool Survival Study
Lower Snake	Anadromous Fish	Pit Tag Facilities Improvement
Lower Snake	Anadromous Fish	Documenting & Estimating Passage- Video Technology
Lower Snake	Anadromous Fish	Technical Assistance For Snake River Drawdown
Tucannon	Anadromous Fish	Improve Fish Passage At Starbuck Dam
Tucannon	Anadromous Fish	Tucannon River Bank Control
Tucannon	Anadromous Fish	Pataha Basin Habitat Improvements - Seven Sites
Tucannon	Anadromous Fish	Tucannon Habitat Improvements - Rubenser Site
Tucannon	Anadromous Fish	Tucannon Stream & Riparian Restoration
Tucannon	Anadromous Fish	Pataha Creek Stream & Cropland Restoration
Tucannon	Anadromous Fish	Pataha Creek Model Watershed Project
Tucannon	Anadromous Fish	Tucannon River Early Action Projects
Tucannon	Anadromous Fish	Tucannon Rootwad Collection
Tucannon	Anadromous Fish	Tucannon Large Woody Debris Manipulation
Tucannon	Anadromous Fish	Pataha Creek Early Action Projects
Tucannon	Anadromous Fish	Habitat Improvements, Ledgerwood Farms, Pataha Cr
Tucannon	Anadromous Fish	Tucannon River Watershed Fish Habitat Restoration
Tucannon	Anadromous Fish	Pataha Creek Stream Channel & Cropland Restoration
Tucannon	Anadromous Fish	Tucannon Watershed Project Implementation
Tucannon	Anadromous Fish	Pataha Watershed Project Planning & Implementation
Tucannon	Anadromous Fish	Tucannon River Watershed Fish Habitat Enhancement
Tucannon	Anadromous Fish	Pataha Watershed Riparian & Croplands Restoration
Tucannon	Anadromous Fish	Tucannon River Spring Chinook Captive Broodstock
Umatilla	Anadromous Fish	Design Bonifer Juvenile Imprinting / Release Site
Umatilla	Anadromous Fish	Restore & Enhance Salmon In The Umatilla Basin
Umatilla	Anadromous Fish	Bonifer Springs Acclimation Facility
Umatilla	Anadromous Fish	Umatilla River Channel Modification
Umatilla	Anadromous Fish	Operate And Maintain Umatilla Hatchery Satellites
Umatilla	Anadromous Fish	Umatilla Passage O & M
Umatilla	Anadromous Fish	Lower Umatilla Channel Modifications Assessment
Umatilla	Anadromous Fish	Umatilla Basin Salmon & Steelhead Restoration Plan

Subbasin	Program	Title
Umatilla	Anadromous Fish	Umatilla Hatchery
Umatilla	Anadromous Fish	Umatilla Hatchery - Cost Verification
Umatilla	Anadromous Fish	Umatilla Hatchery - Design Review
Umatilla	Anadromous Fish	Umatilla Hatchery - Tribal Fish Culture Training
Umatilla	Anadromous Fish	Review Of Umatilla Hatchery Oxygen Design
Umatilla	Anadromous Fish	Umatilla Hatchery - Design Change Order Consultant
Umatilla	Anadromous Fish	Umatilla Habitat Improvement/ USFS
Umatilla	Anadromous Fish	Umatilla Habitat Improvement / CTUIR
Umatilla	Anadromous Fish	Umatilla Fish Habitat Improvement / ODFW
Umatilla	Anadromous Fish	Umatilla Passage Improvements- Westland Diversion
Umatilla	Anadromous Fish	Umatilla Passage Improvements- Stanfield Diversion
Umatilla	Anadromous Fish	Improvements At Westland Diversion
Umatilla	Anadromous Fish	Replacement Pumping To Weid Main Canal
Umatilla	Anadromous Fish	Film Umatilla River And Three Mile Dam Enhancement
Umatilla	Anadromous Fish	Umatilla Hatchery - Master Plan
Umatilla	Anadromous Fish	Umatilla Passage Improvements - Maxwell Diversion
Umatilla	Anadromous Fish	Umatilla Passage Improvements - Cold Springs
Umatilla	Anadromous Fish	Hydraulic Review/Drilling, Westland Diversion
Umatilla	Anadromous Fish	Umatilla River Project Slide Show
Umatilla	Anadromous Fish	Umatilla River Basin Trap And Haul Program
Umatilla	Anadromous Fish	Weid Main Canal Pumping - Umatilla Basin
Umatilla	Anadromous Fish	Neoh Master Plan - CTUIR - Parametrix - Umatilla
Umatilla	Anadromous Fish	Evaluate Umatilla Project- Smolt Migration
Umatilla	Anadromous Fish	Umatilla - Columbia Water Exchange Project
Umatilla	Anadromous Fish	Stanfield/ Mckay Water Release Project
Umatilla	Anadromous Fish	Umatilla Hatchery -NEPA & Operations & Maintenance
Umatilla	Anadromous Fish	Umatilla Hatchery - M&E Projects
Umatilla	Anadromous Fish	Umatilla Basin Natural Production M&E
Umatilla	Anadromous Fish	Umatilla Satellites - Planning & Construction
Umatilla	Anadromous Fish	Law Enforcement Transition Funding - CTUIR
Umatilla	Anadromous Fish	Fred Grey Property Acquisition
Umatilla	Anadromous Fish	Pacific Lamprey Population Studies
Umatilla	Anadromous Fish	Umatilla River Riparian Corridor
Umatilla	Anadromous Fish	Nursery Bridge Local Cost Share
Umatilla	Anadromous Fish	Umatilla Basin Stream Habitat Enhancement
Umatilla	Anadromous Fish	CTUIR - Nursery For Fish Habitat Plants
Umatilla	Anadromous Fish	Umatilla River Basin Fish Passage Improvement
Umatilla	Anadromous Fish	Umatilla River Basin Fish Habitat Improvement

Subbasin	Program	Title
Umatilla	Anadromous Fish	Umatilla Basin Habitat Project Coordination
Umatilla	Anadromous Fish	Riparian Recovery: Plant Succession And Salmon
Umatilla	Wildlife	Squaw Creek Watershed Wildlife Project
Walla Walla	Anadromous Fish	Juvenile & Adult Passage- Walla Walla Basin
Walla Walla	Anadromous Fish	Little Walla Walla Screens And Trap
Walla Walla	Anadromous Fish	Garden City/Lowden 2 Diversion Screens
Walla Walla	Anadromous Fish	Burlingame Screens Construction Management
Walla Walla	Anadromous Fish	Hofer Dam Passage
Walla Walla	Anadromous Fish	Little Walla Walla Consolidation Milton/Eastside
Walla Walla	Anadromous Fish	Walla Walla Basin Anadromous Fish Passage
Walla Walla	Anadromous Fish	Walla Walla Basin Stream Habitat Enhancement
Walla Walla	Anadromous Fish	Walla Walla River Basin Fish Habitat Enhancement
Walla Walla	Anadromous Fish	Walla Walla River Basin Fish Habitat - Swcd
Walla Walla	Anadromous Fish	Walla Walla & Touchet Rivers & Mill Cr Restoration
Walla Walla	Anadromous Fish	Assess Salmonid Habitat Walla Walla Watershed - Wa
Walla Walla	Anadromous Fish	Assess Fish Habitat & Salmonoids In Walla Walla
Walla Walla	Anadromous Fish	Walla Walla River Fish Passage Operations
Walla Walla	Anadromous Fish	Design And Construct Neoh Walla Walla Hatchery
Walla Walla	Anadromous Fish	Walla Walla River Basin Monitoring And Evaluation
Walla Walla	Wildlife	Rainwater Wildlife Area Operations & Maintenance

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Appendix I

BUILD YOUR OWN ALTERNATIVE

A: "Build Your Own Alternative"

This appendix is designed to enable people throughout the region to build their own version of the "right" plan for the fish and wildlife mitigation and recovery effort. Subsequently, the different perspectives provided through the alternatives that people develop will help shape the ultimate Policy Direction that the BPA Administrator will select as the preferred alternative direction for BPA's unified planning approach. Recognizing that policies underpin the region's fish and wildlife mitigation and recovery choices, BPA has chosen to focus this EIS on a range of distinctly different, but reasonably foreseeable, policy directions (Chapter 3). One or more of these directions through mixing and matching will likely serve as the combination that will ultimately guide BPA's fish and wildlife program implementation and expenditures. To help in the development and understanding of building your own alternative, BPA has used the two major processes being followed under ESA, the NMFS 2000 Biological Opinion and USFWS 2000 Biological Opinion (BiOps), to illustrate how it is done from the information and data in this EIS (Section C below).

As you begin this procedure keep in mind the need to stay focused on the overall objective you are trying to accomplish with your proposal. It is easy to get mired down in details and exceptions to the rule. Since the science for fish and wildlife recovery is uncertain and still developing, much of the difficulty you will experience will be with conflicting social mandates, laws, and personal values (Chapter 2). This conflict and need for making trade-offs is the greatest challenge in making public policy. Remember, trying to accommodate too many values will likely lead to an outcome indicative of none.

There are three basic steps to building your own alternative:

Step one: assess the status of the current fish and wildlife mitigation and recovery effort. Review Section 2.4 in Chapter 2 to gain an understanding of the existing environmental conditions in the region where the fish and wildlife mitigation and recovery effort is underway.

Step two: determine the actions that will best define the proposal for your fish and wildlife mitigation and recovery effort. Review the tables of Sample Implementation Actions in Chapter 3, Section 3A. These tables will first give information about the current state of the mitigation and recovery effort (Status Quo) and then offer numerous examples of the types of actions that have been proposed throughout the region by individuals, interest groups, tribes, states, and federal agencies. The sample actions are sorted by Key Issue areas (Chapter 3, Section 3.1.2) and grouped into one of the five Policy Directions examined in this EIS (Chapter 3, Section 3.2). From these actions, select the ones that best represent your proposal for each of the Key Issue areas. Table A below is provided to help you track your choices of actions and get a visual

representation of your proposal. Section B shows several examples of these illustrations filled out for other proposals throughout the region (Tables B-K).

Step three: determine the environmental consequences of your proposal. Review Chapter 5, section 5.2, to get a general understanding of how and where fish, wildlife, and human effects occur with respect to any plan for fish and wildlife mitigation and recovery. Keep in mind that Section 5.2 is set up to provide checks and balances of the impact areas. The land, water, and fish/wildlife sections are presented from the fish and wildlife perspective because they are the main areas associated with their habitats and daily activities. The air, social, and economic sections are presented from the human perspective because these are the main areas of immediate concern to the daily lives of humans. Obviously, some of these categories effect both fish and wildlife and humans. The grouping was not meant to be exclusive, rather the objective was to ensure an understanding of how the activities and actions taken to help fish/wildlife or humans may impact the other.

Next, review Section 5.3 for an explanation of how the effects from the different sets of sample actions for each Policy Direction change in relationship to the Status Quo. An illustration based on the explanation is given for each environmental consequence. These illustrations are given to offer a visual cue of whether a set of actions is moving the effects in a more positive or negative direction as compared to Status Quo. Using these explanations and illustrations consider where your proposal lies in relationship to the different Policy Directions. Match the effects with your selected set of actions. Realizing that you probably mixed portions of some of the Policy Directions with one another, you will need to do the same with the environmental consequences areas in order to reflect your mix and match approach.

If you want to delve a little deeper into the effects assessment, Table L below is provided to help you understand where the Key Issue area actions and the environmental consequences intersect. From this intersection, you may develop your explanation of the changes from Status Quo to your proposal.

Several cautions are in order for anyone wishing to "mix and match."

- *Compatibility.* Not all combinations of actions are possible; some actions are mutually exclusive.
- *Consistency.* Choosing actions from several different Policy Direction implementation actions may result in a plan that is truly indicative of none.
- *Effectiveness.* A "scattershot" technique that tries to reach too many goals with too little money for each will likely dilute the desired effect.
- *Clarity and Coordination.* The more that different "pieces" of different Directions are mixed, the more likely that confusion might result in interpreting who does what and how.
- *Cause-and-Effect.* If you change or substitute an action, remember that you are also substituting the effects (natural resource and/or socioeconomic) of that action.

Table A: Visual Aid for New Proposal Alternative

Key Regional Issues	Proposal #1					Proposal #2				
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹				
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF
1 Habitat										
1-1 Anadromous Fish										
1-2 Resident Fish										
1-3 Introduced Species										
1-4 Wildlife										
1-5 Pred. Anad. Fish										
1-6 Watersheds										
1-7 Tributaries										
1-8 Mainstem Col.										
1-9 Reservoirs										
1-10 Estuaries										
1-11 Water Quality										
2 Harvest										
2-1 Anadromous Fish										
2-2 Resident Fish										
2-3 Wildlife										
3 Hatcheries										
3-1 Anadromous Fish										
3-2 Resident Fish										
4 Hydro										
4-1 Dam Mod. & Facil.										
4-2 Hydro Operations										
4-3 Spill										
4-4 Flow										
4-5 Reservoir Levels										
4-6 Water Quality										
4-7 Juv. Fish Trans.										
4-8 Adult Fish Pass.										
4-9 Flood Control										
5 Power										
5-1 Existing Gen.										
5-2 New Energy Res.										
5-3 Trans. Reliability										
6 Industry										
6-1 Industrial Dev.										
6-2 Alum. and Chem.										
6-3 Mining										
6-4 Pulp and Paper										
7 Transportation										
7-1 Navigation										
7-2 Trucking & RR										
8 Agriculture										
8-1 Irrigation										
8-2 Pest./Ag. Practices										
8-3 Grazing										
8-4 Forestry										
9 Commercial Fishing										
10 Resid./Comm. Dev.										
11 Recreation										
12 Tribes										
12-1 Tribal Harvest										
12-2 Trad, Hlth, Spirit										

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

B: Illustrations of Proposals
Table B: Visual Representation of Status Quo

Key Regional Issues	Status Quo				
	BPA Alt. Policy Dir.				
	NF	WS	SU	SS	CF
1 Habitat					
1-1 Anadromous Fish			■		
1-2 Resident Fish			■		
1-3 Introduced Species		■			
1-4 Wildlife			■		
1-5 Pred. Anad. Fish			■		
1-6 Watersheds	■				
1-7 Tributaries			■		
1-8 Mainstem Col.				■	
1-9 Reservoirs		■			
1-10 Estuaries				■	
1-11 Water Quality		■			
2 Harvest					
2-1 Anadromous Fish				■	
2-2 Resident Fish			■		
2-3 Wildlife			■		
3 Hatcheries					
3-1 Anadromous Fish				■	
3-2 Resident Fish			■		
4 Hydro					
4-1 Dam Mod. & Facil.				■	
4-2 Hydro Operations			■		
4-3 Spill			■		
4-4 Flow			■		
4-5 Reservoir Levels				■	
4-6 Water Quality			■		
4-7 Juv. Fish Trans.			■		
4-8 Adult Fish Pass.				■	
4-9 Flood Control					■
5 Power					
5-1 Existing Gen.			■		
5-2 New Energy Res.				■	
5-3 Trans. Reliability			■		
6 Industry					
6-1 Industrial Dev.				■	
6-2 Alum. And Chem.				■	
6-3 Mining				■	
6-4 Pulp and Paper				■	
7 Transportation					
7-1 Navigation			■		
7-2 Trucking & Rail.			■		
8 Agriculture					
8-1 Irrigation			■		
8-2 Pest./Ag. Practices			■		
8-3 Grazing			■		
8-4 Forestry			■		
9 Commercial					
			■		
10 Resid./Comm.					
			■		
11 Recreation					
			■		
12 Tribes					
12-1 Tribal Harvest				■	
12-2 Trad, Hlth, Spirit			■		

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus .

Table C: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Multi-Species Framework Alt. 1					Multi-Species Framework Alt. 2					Multi-Species Framework Alt. 3					Multi-Species Framework Alt. 4					Multi-Species Framework Alt. 5					
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	
1 Habitat																										
1-1 Anadromous Fish	■																									
1-2 Resident Fish						■																				
1-3 Introduced Species		■					■																			
1-4 Wildlife			■																							
1-5 Pred. Anad. Fish			■																							
1-6 Watersheds																										
1-7 Tributaries			■			■																				
1-8 Mainstem Col.	■																									
1-9 Reservoirs																										
1-10 Estuaries																										
1-11 Water Quality			■																							
2 Harvest																										
2-1 Anadromous Fish		■																								
2-2 Resident Fish																										
2-3 Wildlife																										
3 Hatcheries																										
3-1 Anadromous Fish		■																								
3-2 Resident Fish	■																									
4 Hydro																										
4-1 Dam Mod. & Facil		■																								
4-2 Hydro Operations																										
4-3 Spill				■																						
4-4 Flow		■																								
4-5 Reservoir Levels		■																								
4-6 Water Quality																										
4-7 Juv. Fish Trans.																										
4-8 Adult Fish Pass.		■																								
4-9 Flood Control																										
5 Power																										
5-1 Existing Gen.		■																								
5-2 New Energy Res.																										
5-3 Trans. Reliability																										
6 Industry																										
6-1 Industrial Dev.																										
6-2 Alum. and Chem.																										
6-3 Mining																										
6-4 Pulp and Paper																										
7 Transportation																										
7-1 Navigation																										
7-2 Trucking & RR																										
8 Agriculture																										
8-1 Irrigation				■																						
8-2 Pest./Ag. Practices		■																								
8-3 Grazing		■																								
8-4 Forestry																										
9 Commercial Fishing																										
10 Resid./Comm. Dev.																										
11 Recreation																										
12 Tribes																										
12-1 Tribal Harvest		■																								
12-2 Trad, Hlth, Spirit																										

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

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Table D: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Multi-Species Framework Alt. 6					Multi-Species Framework Alt. 7					Human Effects Analysis Appendix D					NPPC Draft 2000 Fish & Wildlife Prog				
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹				
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF
1 Habitat																				
1-1 Anadromous Fish			■							■										■
1-2 Resident Fish			■							■										
1-3 Introduced Species																				
1-4 Wildlife			■																■	
1-5 Pred. Anad. Fish																		■		
1-6 Watersheds																			■	
1-7 Tributaries	■																		■	
1-8 Mainstem Col.																				
1-9 Reservoirs																				
1-10 Estuaries																				
1-11 Water Quality																				
2 Harvest																				
2-1 Anadromous Fish			■																■	
2-2 Resident Fish																			■	
2-3 Wildlife																				
3 Hatcheries																				
3-1 Anadromous Fish					■														■	
3-2 Resident Fish							■												■	
4 Hydro																				
4-1 Dam Mod. & Facil																				■
4-2 Hydro Operations																				■
4-3 Spill																				
4-4 Flow					■															■
4-5 Reservoir Levels																				
4-6 Water Quality																				
4-7 Juv. Fish Trans.					■															■
4-8 Adult Fish Pass.																				■
4-9 Flood Control																				■
5 Power																				
5-1 Existing Gen.																				■
5-2 New Energy Res.																				
5-3 Trans. Reliability																				
6 Industry																				
6-1 Industrial Dev.																				■
6-2 Alum. and Chem.																				■
6-3 Mining																				■
6-4 Pulp and Paper																				
7 Transportation																				
7-1 Navigation																				■
7-2 Trucking & RR																				■
8 Agriculture																				
8-1 Irrigation																				■
8-2 Pest./Ag. Practices																				■
8-3 Grazing																				■
8-4 Forestry																				■
9 Commercial Fishing																				
																				■
10 Resid./Comm. Dev.																				
																				■
11 Recreation																				
																				■
12 Tribes																				
12-1 Tribal Harvest																				■
12-2 Trad, Hlth, Spirit																				■

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Table E: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Spirit of the Salmon					Tribal Vision					Governors' Recommendations					Lower Col. River Estuary Program				
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹				
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF
1 Habitat																				
1-1 Anadromous Fish		■						■						■						
1-2 Resident Fish																				
1-3 Introduced Species																		■		
1-4 Wildlife								■												
1-5 Pred. Anad. Fish														■						
1-6 Watersheds				■										■						
1-7 Tributaries														■						
1-8 Mainstem Col.	■			■					■					■					■	
1-9 Reservoirs																				
1-10 Estuaries		■																	■	
1-11 Water Quality				■					■										■	
2 Harvest																				
2-1 Anadromous Fish				■		■														■
2-2 Resident Fish																				■
2-3 Wildlife								■												
3 Hatcheries																				
3-1 Anadromous Fish				■										■						
3-2 Resident Fish									■					■						
4 Hydro																				
4-1 Dam Mod. & Facil									■					■						
4-2 Hydro Operations																		■		
4-3 Spill																				
4-4 Flow						■													■	
4-5 Reservoir Levels																				
4-6 Water Quality																				
4-7 Juv. Fish Trans.						■														
4-8 Adult Fish Pass.				■																
4-9 Flood Control																		■		
5 Power																				
5-1 Existing Gen.																				
5-2 New Energy Res.																			■	
5-3 Trans. Reliability																				
6 Industry																				
6-1 Industrial Dev.																				
6-2 Alum. and Chem.																			■	
6-3 Mining																				
6-4 Pulp and Paper																			■	
7 Transportation																				
7-1 Navigation																				
7-2 Trucking & RR																				
8 Agriculture																				
8-1 Irrigation				■		■														
8-2 Pest./Ag. Practices																				
8-3 Grazing						■														
8-4 Forestry																			■	
9 Commercial Fishing																				
		■																		
10 Resid./Comm. Dev.																				
11 Recreation																				
12 Tribes																				
12-1 Tribal Harvest				■																
12-2 Trad, Hlth, Spirit									■											

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Table F: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Framework Concept Paper 1					Framework Concept Paper 2					Framework Concept Paper 3					Framework Concept Paper 4					Framework Concept Paper 5					
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	
1 Habitat																										
1-1 Anadromous Fish																										
1-2 Resident Fish																										
1-3 Introduced Species																										
1-4 Wildlife																										
1-5 Pred. Anad. Fish																										
1-6 Watersheds																										
1-7 Tributaries																										
1-8 Mainstem Col.																										
1-9 Reservoirs																										
1-10 Estuaries																										
1-11 Water Quality																										
2 Harvest																										
2-1 Anadromous Fish																										
2-2 Resident Fish																										
2-3 Wildlife																										
3 Hatcheries																										
3-1 Anadromous Fish																										
3-2 Resident Fish																										
4 Hydro																										
4-1 Dam Mod. & Facil																										
4-2 Hydro Operations																										
4-3 Spill																										
4-4 Flow																										
4-5 Reservoir Levels																										
4-6 Water Quality																										
4-7 Juv. Fish Trans.																										
4-8 Adult Fish Pass.																										
4-9 Flood Control																										
5 Power																										
5-1 Existing Gen.																										
5-2 New Energy Res.																										
5-3 Trans. Reliability																										
6 Industry																										
6-1 Industrial Dev.																										
6-2 Alum. And Chem.																										
6-3 Mining																										
6-4 Pulp and Paper																										
7 Transportation																										
7-1 Navigation																										
7-2 Trucking & RR																										
8 Agriculture																										
8-1 Irrigation																										
8-2 Pest./Ag. Practices																										
8-3 Grazing																										
8-4 Forestry																										
9 Commercial Fishing																										
10 Resid./Comm. Dev.																										
11 Recreation																										
12 Tribes																										
12-1 Tribal Harvest																										
12-2 Trad, Hlth, Spirit																										

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Table G: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Framework Concept Paper 6					Framework Concept Paper 7					Framework Concept Paper 8					Framework Concept Paper 9					Framework Concept Paper 10					
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	
1 Habitat																										
1-1 Anadromous Fish		■																								
1-2 Resident Fish		■																								
1-3 Introduced Species																										
1-4 Wildlife									■																	
1-5 Pred. Anad. Fish	■																									
1-6 Watersheds																										
1-7 Tributaries									■																	
1-8 Mainstem Col.																										
1-9 Reservoirs																										
1-10 Estuaries									■																	
1-11 Water Quality																										
2 Harvest																										
2-1 Anadromous Fish		■																								
2-2 Resident Fish																										
2-3 Wildlife																										
3 Hatcheries																										
3-1 Anadromous Fish		■																								
3-2 Resident Fish																										
4 Hydro																										
4-1 Dam Mod. & Facil	■								■																	
4-2 Hydro Operations																										
4-3 Spill																										
4-4 Flow		■																								
4-5 Reservoir Levels																										
4-6 Water Quality																										
4-7 Juv. Fish Trans.																										
4-8 Adult Fish Pass.																										
4-9 Flood Control																										
5 Power																										
5-1 Existing Gen.																										
5-2 New Energy Res.																										
5-3 Trans. Reliability																										
6 Industry																										
6-1 Industrial Dev.																										
6-2 Alum. And Chem.																										
6-3 Mining																										
6-4 Pulp and Paper																										
7 Transportation																										
7-1 Navigation																										
7-2 Trucking & RR																										
8 Agriculture																										
8-1 Irrigation																										
8-2 Pest./Ag. Practices																										
8-3 Grazing																										
8-4 Forestry																										
9 Commercial Fishing																										
10 Resid./Comm. Dev.																										
11 Recreation																										
12 Tribes																										
12-1 Tribal Harvest																										
12-2 Trad, Hlth, Spirit																										

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Table H: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Framework Concept Paper 11					Framework Concept Paper 12					Framework Concept Paper 13					Framework Concept Paper 14					Framework Concept Paper 15					
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	
1 Habitat																										
1-1 Anadromous Fish																										
1-2 Resident Fish																										
1-3 Introduced Species																										
1-4 Wildlife																										
1-5 Pred. Anad. Fish																										
1-6 Watersheds																										
1-7 Tributaries																										
1-8 Mainstem Col.																										
1-9 Reservoirs																										
1-10 Estuaries																										
1-11 Water Quality																										
2 Harvest																										
2-1 Anadromous Fish																										
2-2 Resident Fish																										
2-3 Wildlife																										
3 Hatcheries																										
3-1 Anadromous Fish																										
3-2 Resident Fish																										
4 Hydro																										
4-1 Dam Mod. & Facil																										
4-2 Hydro Operations																										
4-3 Spill																										
4-4 Flow																										
4-5 Reservoir Levels																										
4-6 Water Quality																										
4-7 Juv. Fish Trans.																										
4-8 Adult Fish Pass.																										
4-9 Flood Control																										
5 Power																										
5-1 Existing Gen.																										
5-2 New Energy Res.																										
5-3 Trans. Reliability																										
6 Industry																										
6-1 Industrial Dev.																										
6-2 Alum. And Chem.																										
6-3 Mining																										
6-4 Pulp and Paper																										
7 Transportation																										
7-1 Navigation																										
7-2 Trucking & RR																										
8 Agriculture																										
8-1 Irrigation																										
8-2 Pest./Ag. Practices																										
8-3 Grazing																										
8-4 Forestry																										
9 Commercial Fishing																										
10 Resid./Comm. Dev.																										
11 Recreation																										
12 Tribes																										
12-1 Tribal Harvest																										
12-2 Trad, Hlth, Spirit																										

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Table I: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Framework Concept Paper 16					Framework Concept Paper 17					Framework Concept Paper 18					Framework Concept Paper 19					Framework Concept Paper 20					
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	
1 Habitat																										
1-1 Anadromous Fish																										
1-2 Resident Fish																										
1-3 Introduced Species																										
1-4 Wildlife																										
1-5 Pred. Anad. Fish																										
1-6 Watersheds																										
1-7 Tributaries																										
1-8 Mainstem Col.																										
1-9 Reservoirs																										
1-10 Estuaries																										
1-11 Water Quality																										
2 Harvest																										
2-1 Anadromous Fish																										
2-2 Resident Fish																										
2-3 Wildlife																										
3 Hatcheries																										
3-1 Anadromous Fish																										
3-2 Resident Fish																										
4 Hydro																										
4-1 Dam Mod. & Facil																										
4-2 Hydro Operations																										
4-3 Spill																										
4-4 Flow																										
4-5 Reservoir Levels																										
4-6 Water Quality																										
4-7 Juv. Fish Trans.																										
4-8 Adult Fish Pass.																										
4-9 Flood Control																										
5 Power																										
5-1 Existing Gen.																										
5-2 New Energy Res.																										
5-3 Trans. Reliability																										
6 Industry																										
6-1 Industrial Dev.																										
6-2 Alum. And Chem.																										
6-3 Mining																										
6-4 Pulp and Paper																										
7 Transportation																										
7-1 Navigation																										
7-2 Trucking & RR																										
8 Agriculture																										
8-1 Irrigation																										
8-2 Pest./Ag. Practices																										
8-3 Grazing																										
8-4 Forestry																										
9 Commercial Fishing																										
10 Resid./Comm. Dev.																										
11 Recreation																										
12 Tribes																										
12-1 Tribal Harvest																										
12-2 Trad, Hlth, Spirit																										

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Table J: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Framework Concept Paper 21					Framework Concept Paper 22					Framework Concept Paper 23					Framework Concept Paper 24					Framework Concept Paper 25					
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	
1 Habitat																										
1-1 Anadromous Fish																										
1-2 Resident Fish																										
1-3 Introduced Species																										
1-4 Wildlife																										
1-5 Pred. Anad. Fish																										
1-6 Watersheds																										
1-7 Tributaries																										
1-8 Mainstem Col.																										
1-9 Reservoirs																										
1-10 Estuaries																										
1-11 Water Quality																										
2 Harvest																										
2-1 Anadromous Fish																										
2-2 Resident Fish																										
2-3 Wildlife																										
3 Hatcheries																										
3-1 Anadromous Fish																										
3-2 Resident Fish																										
4 Hydro																										
4-1 Dam Mod. & Facil																										
4-2 Hydro Operations																										
4-3 Spill																										
4-4 Flow																										
4-5 Reservoir Levels																										
4-6 Water Quality																										
4-7 Juv. Fish Trans.																										
4-8 Adult Fish Pass.																										
4-9 Flood Control																										
5 Power																										
5-1 Existing Gen.																										
5-2 New Energy Res.																										
5-3 Trans. Reliability																										
6 Industry																										
6-1 Industrial Dev.																										
6-2 Alum. And Chem.																										
6-3 Mining																										
6-4 Pulp and Paper																										
7 Transportation																										
7-1 Navigation																										
7-2 Trucking & RR																										
8 Agriculture																										
8-1 Irrigation																										
8-2 Pest./Ag. Pract.																										
8-3 Grazing																										
8-4 Forestry																										
9 Commercial Fishing																										
10 Resid./Comm. Dev.																										
11 Recreation																										
12 Tribes																										
12-1 Tribal Harvest																										
12-2 Trad, Hlth, Spirit																										

³ BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Table K: Visual Crosswalk Between Chapter 3 Tables & Proposed Alternative Policy Directions

Key Regional Issues	Framework Concept Paper 26					Framework Concept Paper 27					Framework Concept Paper 28				
	BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹					BPA Alt. Policy Dir. ¹				
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF
1 Habitat															
1-1 Anadromous Fish					■										
1-2 Resident Fish															
1-3 Introduced Spa.					■										
1-4 Wildlife					■										
1-5 Pred. Anad. Fish					■				■						
1-6 Watersheds					■										
1-7 Tributaries					■										
1-8 Mainstem					■										
1-9 Reservoirs					■										
1-10 Estuaries									■						
1-11 Water Quality									■						
2 Harvest															
2-1 Anadromous Fish					■		■			■					
2-2 Resident Fish															
2-3 Wildlife															
3 Hatcheries															
3-1 Anadromous Fish					■					■					
3-2 Resident Fish										■					
4 Hydro															
4-1 Dam Mod. & Facil					■										
4-2 Hydro Operations					■										
4-3 Spill					■					■					
4-4 Flow					■									■	
4-5 Reservoir Levels															
4-6 Water Quality															
4-7 Juv. Fish Trans.					■					■					
4-8 Adult Fish Pass.															
4-9 Flood Control															
5 Power															
5-1 Existing Gen.					■										
5-2 New Energy Res.															
5-3 Trans. Reliability															
6 Industry															
6-1 Industrial Dev.															
6-2 Alum. and Chem.															
6-3 Mining															
6-4 Pulp and Paper															
7 Transportation															
7-1 Navigation					■										
7-2 Trucking & RR															
8 Agriculture															
8-1 Irrigation					■					■					■
8-2 Pest./Ag. Practices										■					
8-3 Grazing										■					
8-4 Forestry										■					
9 Commercial Fishing															
										■					
10 Resid./Comm. Dev.															
11 Recreation															
										■					
12 Tribes															
12-1 Tribal Harvest										■					■
12-2 Trad, Hlth, Spirit						■									■

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Table L: Suggested Review of Key Issues for Environmental Consequences

NATURAL ENVIRONMENT	
<u>Environmental Effect</u>	<u>Associated Key Issues</u>
<i><u>Land Use</u></i>	
Upland	1-6, 5-2, 5-3, 6-1, 6-2, 6-3, 8-1, 8-2, 8-3, 8-4, 10, & 11
Riparian/Wetland	1-6, 1-7, 1-8, 1-9, 1-10, 4-2, 4-5, 4-9, 6-1, 6-3, 8-1, 8-2, 8-3, 8-4, & 10
<i><u>Water</u></i>	
Nitrogen Supersaturation	1-11, 4-2, 4-3, & 4-6
Non-Thermal Pollution	1-11, 4-6, 6-1, 6-2, 6-3, 6-4, 8-2, 8-3, & 10
Sedimentation	1-11, 4-2, 4-5, 4-6, 8-1, 8-2, 8-3, 8-4, & 10
Temperature/Dissolved Gas	1-11, 4-2, 4-3, 4-4, 4-5, 5-1, 5-2, 6-1, 6-2, 6-4, 8-1, 8-2, & 8-4
Instream Water Quality	1-6, 1-7, 1-8, 1-11, 4-3, 4-4, 4-5, 4-9, & 8-1
Amount of River Habitat	1-7, 1-8, 1-9, 1-10, 1-11, 4-2, 4-4, 4-5, 4-9, & 8-1
Reservoir Habitat	1-3, 1-9, 1-11, 4-2, 4-5, 4-6, & 8-1
<i><u>Fish & Wildlife</u></i>	
Anadromous Fish	1-1, 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 2-1, 3-1, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 9, & 12-1
Resident Fish	1-2, 1-3, 1-6, 1-7, 1-8, 1-9, 1-11, 2-2, 3-2, 4-1, 4-2, 4-5, 4-6, 4-9, & 12-1
Wildlife	1-4, 1-6, 2-3, 5-2, 5-3, 6-1, 8-1, 8-2, 8-3, 8-4, & 11
Air Quality	5-1, 5-2, 6-1, 6-2, 6-4, 7-2, & 10
SOCIAL and ECONOMIC	
<i><u>Commerce</u></i>	
Commercial Interests	2-1, 2-2, 2-3, 4-2, & all of 5-9
Recreation (fishing & hunting)	All of 2, 4-5, & 11
Economic Development	3-1, 3-2, 4-1, 5-1, 5-2, 5-3, & all of 6-10

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Tribes

Fishing Harvest	2-1, 2-2, 3-1, 3-2, 9, & 12-1
Health, Spirituality, Tradition	1-1, 1-2, 1-4, 1-6, 1-7, 1-8, 1-9, 1-11, 2-3, 3-1, 3-2, 4-5, 10, & 12-2

Cost and Funding

All of 1 & 3, 4-1, 4-2, 4-3, 4-7, 4-8, 5-2, 5-3, all of 6-9 & 11

Other

Cultural Resources	4-3, 4-4, 4-5, 5-2, 5-3, 6-1, 10, & 12-2
Aesthetics	1-4, 1-6, 1-11, 4-1, 4-2, 4-3, 4-4, 4-5, 5-2, 5-3, 6-1, 7-2, 8-1, 8-3, 8-4, 10, & 12-2

KEY

1 Habitat

1-1 Anadromous Fish	1-2 Resident Fish	1-3 Introduced Species
1-4 Wildlife	1-5 Predator Anadromous Fish	1-6 Watersheds
1-7 Tributaries	1-8 Mainstem Columbia	1-9 Reservoirs
1-10 Estuary and Ocean	1-11 Water Quality	

2 Harvest

2-1 Anadromous Fish	2-2 Resident Fish	2-3 Wildlife
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3 Hatcheries

3-1 Anadromous Fish	3-2 Resident Fish
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4 Hydro

4-1 Dam Modifications and Facilities	4-2 Hydro Operations	4-3 Spill
4-4 Flow	4-5 Reservoir Levels	4-6 Water Quality
4-7 Juvenile Fish Migration & Transport	4-8 Adult Fish Passage	4-9 Flood Control

5 Power

5-1 Existing Generation	5-2 New Energy Resources	5-3 Transmission Reliability
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6 Industry

6-1 Industrial Development	6-2 Aluminum and Chemical	6-3 Mining
6-4 Pulp and Paper		

7 Transportation

7-1 Navigation	7-2 Trucking & Railroad
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8 Agriculture

8-1 Irrigation	8-2 Pest./Agricultural Practices	8-3 Grazing
8-4 Forestry		

9 Commercial Fishing

10 Residential and Commercial Development

11 Recreation

12 Tribes

12-1 Tribal Harvest	12-2 Health, Spirituality, & Tradition
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² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

C: Example Assessment - 2000 USFWS and NMFS Biological Opinions

This section provides an example of how to complete an assessment when building your own alternative proposal. The 2000 USFWS and NMFS Biological Opinions have been used as the examples to illustrate the assessment. To give an understanding of how the BiOps actions were dispersed across the different Policy Directions evaluated in this EIS, Table M is given below. This table first shows the where the implementing actions were placed in relationship to the Policy Directions. The other half of the table gives an illustration of where the greatest alignment of actions is in relationship to a Policy Direction. Or, in other words, which Policy Direction represents the central theme of the actions being proposed. For both of the BiOps, it is evident that the Weak Stock and Sustainable Use Policy Directions make up the core of the actions. Since the current plan under both BiOps is not to breach dams initially, the central tendency leaned toward the Sustainable Use Policy Direction. As shown, however, there are a few actions that are outside either of those Policy Directions.

The reason for describing the central tendency of the Policy Direction for the two BiOps is twofold: 1) it is easier to determine if future implementing actions are consistent with previous actions and planning goals; and 2) to ensure that expenditures are made efficiently when trying to achieve the overall objective. For example, look at the areas under habitat (1) and hydro (4). Many of the boxes representing the recommended actions are filled in across the Policy Directions. Earlier in this Appendix and in Chapter 3 we explained how being spread across too many Policy Directions could cause confusion on the part of those who must implement actions in the future. It is much more difficult to determine whether future actions are consistent with the previous actions if the overall direction is unclear. Also, consider the time and money that can be spent trying to settle disagreements over what was intended by past actions if there is not a clear Policy Direction guiding the implementation of future actions.

Following the illustrations in Table M, we used the information from Chapter 5, sections 5.2 and 5.3, to complete the assessment. Note that the shading of the different BiOps was done in the same manner of the other chapters by comparing them to the Status Quo.

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Table M: Visual Representation of 2000 USFWS and NMFS Biological Opinions

Key Regional Issues	ACTION PLACEMENT					CENTRAL POLICY DIRECTION														
	USFWS BiOp					NMFS BiOp					USFWS BiOp					NMFS BiOp				
	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF	NF	WS	SU	SS	CF
1 Habitat																				
1-1 Anadromous Fish																				
1-2 Resident Fish																				
1-3 Introduced Species																				
1-4 Wildlife																				
1-5 Pred. Anad. Fish																				
1-6 Watersheds																				
1-7 Tributaries																				
1-8 Mainstem Col.																				
1-9 Reservoirs																				
1-10 Estuaries																				
1-11 Water Quality																				
2 Harvest																				
2-1 Anadromous Fish																				
2-2 Resident Fish																				
2-3 Wildlife																				
3 Hatcheries																				
3-1 Anadromous Fish																				
3-2 Resident Fish																				
4 Hydro																				
4-1 Dam Mod. & Facil																				
4-2 Hydro Operations																				
4-3 Spill																				
4-4 Flow																				
4-5 Reservoir Levels																				
4-6 Water Quality																				
4-7 Juv. Fish Trans.																				
4-8 Adult Fish Pass.																				
4-9 Flood Control																				
5 Power																				
5-1 Existing Gen.																				
5-2 New Energy Res.																				
5-3 Trans. Reliability																				
6 Industrv																				
6-1 Industrial Dev.																				
6-2 Alum. and Chem.																				
6-3 Mining																				
6-4 Pulp and Paper																				
7 Transportation																				
7-1 Navigation																				
7-2 Trucking & RR																				
8 Agriculture																				
8-1 Irrigation																				
8-2 Pest./Ag. Practices																				
8-3 Grazing																				
8-4 Forestry																				
9 Commercial Fishing																				
10 Resid./Comm. Dev.																				
11 Recreation																				
12 Tribes																				
12-1 Tribal Harvest																				
12-2 Trad, Hlth, Spirit																				

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Environmental Consequences Assessment



Effect Subcategory	Status Quo	NMFS & USFWS 2000 Biological Opinions
Air Quality		
CO		
CO2		
Nox		
PM10		
Sox		

EXPLANATION:

Air emissions may increase from operation changes causing the need for additional combustion turbines to replace any lost peaking capability. The air quality is expected to be degraded a small amount more than under Status Quo. If breaching or drawdown were needed in the long- term, the change in air emissions would considerably increase from the replacement power for lost hydropower and the prolonged operation of existing thermal resources. The air quality effects would be worse than under Status Quo, similar to the Weak Stock Focus.

EXAMPLES:

Should the current power emergency on the West Coast persist, the temporary water management actions foreseen by the BO, may cause a reevaluation of the policy direction or yield to new generation.

The Action Agencies shall operate FCRPS dams and reservoirs with the intent of meeting the flow objectives (Table 9.6-1) on both a seasonal and weekly average basis for the benefit of migrating juvenile salmon. (NMFS Biological Opinion Action Table Dec. 2000)

BPA's Transmission Business Line shall continue to evaluate strategically located generation additions and other transmission system improvements and report progress to NMFS annually. BPA's Transmission Business Line shall also limit future reservations for transmission capacity, as needed, to enable additional spill to meet performance standards, while minimizing effects on transmission rights holders. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Land Habitat		
Upland habitat quality		
Upland habitat amount		
Riparian/ wetland habitat quality		
Riparian/ wetland habitat amount		

EXPLANATION:

Immediate, substantial human intervention to preserve and restore lost habitat for weak native stocks, especially in areas designated critical habitat for threatened or endangered species. Mostly active and some passive habitat restoration used to obtain habitat features for weak stocks. Overall, much more habitat for weak native ESA listed species, and some habitat for non-listed species would be preserved and restored.

EXAMPLES:

- The Action Agencies, with assistance from NMFS and USFWS, shall annually develop 1- and 5-year plans for habitat measures that provide offsite mitigation. (NMFS Biological Opinion Action Table Dec. 2000).
- The Action Agencies shall coordinate their efforts and support offsite habitat enhancement measures undertaken by other Federal agencies, states, Tribes, and local governments by the following: (See RPA) (FFCRPS Biological Opinion 2000 Action Table).
- In subbasins with listed salmon and steelhead, BPA shall fund protection of currently productive non-Federal habitat, especially if at risk of being degraded, in accordance with criteria and priorities BPA and NMFS will develop by June 1, 2001. (NMFS Biological Opinion 2000 Action Table Dec. 2000).
- BPA shall, working with agricultural incentive programs such as the Conservation Reserve Enhancement Program, negotiate and fund long-term protection for 100 miles of riparian buffers per year in accordance with criteria BPA and NMFS will develop by June 1, 2001. (NMFS Biological Opinion 2000 Action Table Dec. 2000)
- BPA shall fund actions to improve and restore tributary and mainstem habitat for CR chum salmon in the reach between The Dalles Dam and the mouth of the Columbia River. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

OTHER CONSIDERATIONS:

Due to the loss of available hydropower the need for new generation and transmission would accelerate planned development having some increase over Status Quo. The effects of building new generation and transmission would have land impacts that offset some of the habitat gains above. Overall the change in land habitat would be about the same as Status Quo, If breaching or drawdown occur in the future, the effects would lead to substantial trade-offs of land habitat for aquatic habitat leaving the overall land habitat worse than under Status Quo..

EXAMPLES:

- To improve the future flexibility of the transmission system, BPA's Transmission Business Line shall initiate planning and design necessary to construct a Schultz-Hanford 500-kV line or an equivalent project, with a planned schedule for implementation by 2004 or 2005. (NMFS Biological Opinion Action Table Dec. 2000)
- BPA's Transmission Business Line shall continue efforts to evaluate, plan, design, and construct a joint transmission project to upgrade the west-of-Hatwai cutplane and improve the transfer limitations from Montana. (NMFS Biological Opinion Action Table Dec. 2000).

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Water Habitat		
Nitrogen Supersaturation		

EXPLANATION:

Spill and flow regimes would be balanced with local clean water standards. Nitrogen supersaturation, a problem even with improvements, would not be significantly better than Status Quo.

EXAMPLES:

- The Corps and BPA shall implement an annual spill program, consistent with the spill volumes and TDG limits identified in Table 9.6-3, at all mainstem Snake and Columbia River FCRPS projects as part of the annual planning effort to achieve the juvenile salmon and steelhead performance standards. (NMFS Biological Opinion 2000 Action Table Dec. 2000)
- The Corps shall complete its DGAS by April 2001. The results of this study will be used to guide future studies and decisions about implementation of some long-term structural measures to reduce TDG. (NMFS Biological Opinion 2000 Action Table Dec. 2000)
- The Action Agencies shall monitor the effects of TDG. This annual program shall include physical and biological monitoring and shall be developed and implemented in consultation with the Water Quality Team and the Mid-Columbia PUDs' monitoring programs. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

Non-thermal Pollution		
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EXPLANATION:

Increase enforcement of water quality standards for pollutants in critical habitat of weak stocks. Riparian land acquisition and active restoration would reduce up-slope non-point contribution. Use positive incentives, monitoring and enforcement to reduce point and non-point pollution.

Examples:

BOR shall evaluate the water quality characteristics of each point of surface return flows from the Columbia Basin Project to the Columbia River and estimate the effects these return flows may have on listed fish in the Columbia River and in the wasteways accessible to listed fish. By June 1, 2001, BOR shall provide NMFS with a detailed water quality monitoring plan, including a list of water quality parameters to be evaluated. If the water quality sampling reveals enough water quality degradation to adversely affect listed fish, BOR shall develop and initiate implementation of a wasteway water quality remediation plan within 12 months of the completion of the monitoring program. (NMFS Biological Opinion Action Table Dec. 2000)

Sedimentation		
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EXPLANATION:

No breaching in the short-term. Water erosion and sedimentation reduced throughout the basin as part of balanced and more active land use management.

Examples:

- The Action Agencies, in coordination with NMFS, USFWS, and other Federal agencies, Northwest Power Planning Council, states, and Tribes, shall develop a common data management system for fish populations, water quality, and habitat data (NMFS Biological Opinion Action Table Dec. 2000).

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

- The action agencies will work with FWS and Montana Department of Fish, Wildlife, and Parks to re-establish appropriate vegetation in the 20 foot drawdown zone of Hungry Horse Reservoir. A schedule should be developed for plans and funding to be secured by 2003, with implementation by 2005. (FWS Biological Opinion Dec. 2000)

Temperature/ Dissolved Oxygen		
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EXPLANATION:

Overall, temperature and dissolved gas would likely be about the same as Status Quo or slightly better.

EXAMPLES:

- By June 30, 2001, the action agencies shall develop and coordinate with FWS, NMFS and EPA on a plan to model the water temperature effects of alternative Snake River operations, including Libby and Hungry Horse Dams. The modeling plan shall include a temperature data collection strategy developed in consultation with EPA, NMFS, and State and Tribal water quality agencies. The data collection strategy shall be sufficient to develop and operate the model and to document the effects of the project operations. (FWS Biological Opinion Dec. 2000)
- The Corps and BPA shall implement an annual spill program, consistent with the spill volumes and TDG limits identified in Table 9.6-3, at all mainstem Snake and Columbia River FCRPS projects as part of the annual planning effort to achieve the juvenile salmon and steelhead performance standards. (NMFS Biological Opinion Action Table Dec. 2000)
- The Action Agencies shall monitor the effects of TDG. This annual program shall include physical and biological monitoring and shall be developed and implemented in consultation with the Water Quality Team and the Mid-Columbia PUDs' monitoring programs. (NMFS Biological Opinion Action Table Dec. 2000)

Instream Water Quantity		
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EXPLANATION:

Water withdrawals reduced primarily through management and positive incentives.

EXAMPLES:

- The Action Agencies shall develop a plan to conduct a systematic review and evaluation of the TDG fixed monitoring stations in the forebays of all the mainstem Columbia and Snake river dams (including the Camas/Washougal monitor). The evaluation plan shall be developed by February 2001 and included as part of the first annual water quality improvement plan. The Action Agencies shall conduct the evaluation and make changes in the location of fixed monitoring sites, as warranted, and in coordination with the Water Quality Team. It should be possible to make some modifications by the start of the 2001 spill season. (NMFS Biological Opinion Action Table Dec. 2000)

Amount of Stream/River Habitat		
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EXPLANATION:

About the same as Status Quo because no major changes in river management.

EXAMPLES:

- BPA, working with BOR, the Corps, EPA, and USGS, shall develop a program to 1) identify mainstem habitat sampling reaches, survey conditions, describe cause-and-effect relationships, and identify research needs; 2) develop improvement plans for all mainstem reaches; and 3) initiate

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Fish and Wildlife Implementation Plan DEIS
Build Your Own Alternative

improvements in three mainstem reaches. Results shall be reported annually. (NMFS Biological Opinion Action Table Dec. 2000)

- BOR shall pursue water conservation improvements at its projects and shall use all mechanisms available to it under state and Federal law to ensure that a reasonable portion of any water conserved will benefit listed species. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

Reservoir Habitat		
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EXPLANATION:

About the same as Status Quo because no major changes in reservoir habitat would occur.

EXAMPLES:

- The Action Agencies shall operate the FCRPS during the fall and winter months in a manner that achieves refill to April 10 flood control elevations, while meeting project and system minimum flow and flood control constraints before April 10. During the spring, the Action Agencies shall operate the FCRPS to meet the flow objectives and refill the storage reservoirs (Albeni Falls, Dworshak, Grand Coulee, Hungry Horse, and Libby) by approximately June 30. (NMFS Biological Opinion 2000 Action Table Dec. 2000)
- The Corps and BOR shall implement VARQ flood control operations, as defined by the Corps (1999d), at Libby by October 1, 2001, and at Hungry Horse by January 1, 2001. By February 1, 2001, the Corps shall develop a schedule to complete all disclosures, NEPA compliance, and Canadian coordination necessary to implement VARQ flood control at Libby. (NMFS Biological Opinion Action Table Dec. 2000)
- BOR shall operate Banks Lake at an elevation 5 feet from full during August by reducing the volume of water pumped from Lake Roosevelt into Banks Lake by about 130 kaf during this time. (NMFS Biological Opinion Action Table Dec. 2000)

Fish and Wildlife		
Natural Spawning Native Anadromous Fish		
Hatchery Produced Native Anadromous Fish		

EXPLANATION:

Full potential unknown; limited by existing dams and lack of spawning habitat. Population sizes vary substantially due to natural and human-caused factors. Harvest and hatcheries would be controlled to accommodate changes in population status. Less hatchery production and harvest overall. Natural and hatchery fish would increase with habitat, hatchery and harvest improvements.

EXAMPLES:

- In subbasins with listed salmon and steelhead, BPA shall fund protection of currently productive non-Federal habitat, especially if at risk of being degraded, in accordance with criteria and priorities BPA and NMFS will develop by June 1, 2001. (NMFS Biological Opinion Action Table Dec. 2000)
- The Action Agencies shall continue to fund studies that monitor survival, growth, and other early life history attributes of Snake River wild juvenile fall chinook. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

- The Action Agencies shall determine the number of adults passed through turbines, then, if warranted, investigate the survival of adult salmonid passage through turbines (including steelhead kelts). (NMFS Biological Opinion Action Table Dec. 2000)
- The Action Agencies shall conduct a comprehensive evaluation to assess survival of adult salmonids migrating upstream and factors contributing to unaccounted losses. (NMFS Biological Opinion Action Table Dec. 2000)
- The Corps, in coordination with USFWS, shall design and implement appropriate repairs and modifications to provide water supply temperatures for the Dworshak National Fish Hatchery that are conducive to fish health and growth, while allowing variable discharges of cold water from Dworshak Reservoir to mitigate adverse temperature effects on salmon downstream in the lower Snake River. (NMFS Biological Opinion Action Table Dec. 2000)
- The Action Agencies, with assistance from NMFS and USFWS, shall annually develop 1- and 5-year plans for hatchery and harvest measures that provide offsite mitigation. (NMFS Biological Opinion Action Table Dec. 2000)

Native Resident Fish		
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EXPLANATION:

Emphasis remains on listed species, but non-listed native fish benefit from habitat and hydrosystem actions.

EXAMPLES:

- The action agencies shall regulate flows from Libby Dam to achieve water volumes, water velocities, water depths, and water temperature at a time to maximize the probability of allowing significant [Kootenai River white] sturgeon recruitment. (FWS Biological Opinion Dec. 2000)
- Implement VarQ flood control/storage at Libby Dam by October 2001. (FWS Biological Opinion Dec. 2000)
- During water year 2001, (October 1, 2000 - September 30, 2001) the action agencies shall store water and supply, at a minimum, water volumes during May, June and July based upon a water availability or “tiered” approach (in addition to storage needs for listed bull trout, salmon, and the 4,000 cfs minimum releases from Libby Dam) to enhance survival of [Kootenai River white Sturgeon] eggs, yolk sac larvae, or larvae reared under the preservation stocking program and released into the Kootenai River. (FWS Biological Opinion Dec. 2000)

Non-native species		
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EXPLANATION:

Emphasis remains on listed species. Non-native fish are actively managed and reduced to benefit listed species.

EXAMPLES:

- The Action Agencies shall continue to implement and study methods to reduce the loss of juvenile salmonids to predacious fishes in the lower Columbia and lower Snake rivers. This effort will include continuation and improvement of the ongoing Northern Pikeminnow Management Program and evaluation of methods to control predation by non-indigenous predacious fishes, including smallmouth bass, walleye, and channel catfish. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

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Native Wildlife		
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EXPLANATION:

Needs of the listed species balanced against the needs of all species. More habitat, better management. Approach should benefit wildlife species more than status quo.

EXAMPLES:

- The action agencies will work with FWS and Montana Department of Fish, Wildlife, and Parks to re-establish appropriate vegetation in the 20 foot drawdown zone of Hungry Horse Reservoir. A schedule should be developed for plans and funding to be secured by 2003, with implementation by 2005. (FWS Biological Opinion Dec. 2000)
- The Action Agencies, with assistance from NMFS and USFWS, shall annually develop 1- and 5-year plans for habitat measures that provide offsite mitigation. (NMFS Biological Opinion Action Table Dec. 2000)

Commercial Interests		
Power		

EXPLANATION:

Limits on generation at existing facilities. Use flow, spill, drawdowns, peak efficiency turbine operation, and facility modifications to improve in-river juvenile salmon survival; avoid fluctuations caused by power peaking operations. Some hydropower losses compared to Status Quo.

EXAMPLES:

- The Action Agencies shall operate FCRPS dams and reservoirs with the intent of meeting the flow objectives (Table 9.6-1) on both a seasonal and weekly average basis for the benefit of migrating juvenile salmon. (NMFS Biological Opinion Action Table Dec. 2000)

Transmission		
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EXPLANATION:

Important transmission improvements required.

EXAMPLES:

- To improve the future flexibility of the transmission system, BPA's Transmission Business Line shall initiate planning and design necessary to construct a Schultz-Hanford 500-kV line or an equivalent project, with a planned schedule for implementation by 2004 or 2005. (NMFS Biological Opinion Action Table Dec. 2000)
- BPA's Transmission Business Line shall continue efforts to evaluate, plan, design, and construct a joint transmission project to upgrade the west-of-Hatwai cutplane and improve the transfer limitations from Montana. (NMFS Biological Opinion Action Table Dec. 2000).
- The action agencies shall seek redundancy in transformers at Libby Dam to assure that sturgeon flows can be released. Loss of one transformer can result in the loss of use of two turbines, or 10,000 cfs of release capacity. (FWS Biological Opinion Dec. 2000)

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Transportation		
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EXPLANATION:

As there would be no immediate breaching, navigational effects would be delayed possibly indefinitely. Some increases in other transportation costs.

Agriculture and Forestry		
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EXPLANATION:

Land retirement, land management, technology applied to make agricultural and forestry practices more compatible with fish and wildlife. Some land retirement used where cost-effective. Not clear to what extent costs paid by landowners, ratepayers or taxpayers. Overall, similar to status quo.

EXAMPLES:

- BPA shall, working with agricultural incentive programs such as the Conservation Reserve Enhancement Program, negotiate and fund long-term protection for 100 miles of riparian buffers per year in accordance with criteria BPA and NMFS will develop by June 1, 2001. (NMFS Biological Opinion 2000 Action Table Dec. 2000)
- By December 1, 2001, the action agencies shall quantify the effects of groundwater seepage associated with the magnitude and duration of sturgeon flows on crops in the Kootenai Valley relative to all other types high flow/stage events which occur in the Kootenai River. The effects of direct precipitation and runoff from small tributaries within the Kootenai Valley on both surface and ground water levels shall also be accounted for in this study. This shall include delineation of specific sites affected and identification of all feasible remedies specific to those sites such as, drainage, willing seller land purchases, and enrollment in the Department of Agriculture's Wetland Reserve Program. (FWS Biological Opinion Dec. 2000)

Commercial Fish Harvest		
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EXPLANATION:

Continued restrictions on any commercial harvest that may further endanger weak stocks. Possible increased harvest of other stocks as they recover. Increase in targeted/selective harvest. Direct harvest toward hatchery fish and away from healthier wild stocks. Overall, commercial value may increase relative to Status Quo.

EXAMPLES:

- The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies in a multiyear program to develop, test, and deploy selective fishing methods and gear that enable fisheries to target non-listed fish while holding incidental impacts on listed fish within NMFS-defined limits. The design of this program and initial implementation (i.e., at least the testing of new gear types and methods) shall begin in FY 2001. Studies and/or pilot projects shall be under way and/or methods deployed by the 3-year check-in. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

Other industry (esp. mining, forest products, DSIs)		
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EXPLANATION:

Industries affected by more expensive and slightly less reliable electricity. Incentives for environmentally friendly industry and development. Mine site active restoration. Increase in services and government employment to implement intensive programs. Overall effects are adverse.

²BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Recreation		
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Sport Fishing and Wildlife Harvest		
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EXPLANATION:

Restrict methods that risk further degrading weak fish and wildlife species. Promote harvest of non-native species. Manage harvests for ecosystem benefits. Economic benefits to sport fishing and hunting industries may be better than status quo.

Other Recreation		
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EXPLANATION:

Actions to assist weak stocks will consider means to accommodate recreational needs. Other outdoor recreation might benefit from land acquisitions and management for habitat. Overall, about the same as Status Quo, but many losers and winners.

Economic Development		
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Industrial, Residential & Commercial Development		
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EXPLANATION:

Encourage and promote development more compatible with fish and wildlife habitat. About the same as Status Quo

Employment		
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EXPLANATION:

Some loss through increased power costs, increased taxes and subsequently, reduced discretionary income. Employment benefit of new power capacity construction would come sooner than status quo. Increased employment in agricultural and forestry services associated with land management. Commercial fishing effects negative initially, positive later. Overall, decreased employment in sectors where power consumers and agriculture spend and increased employment where natural resource and land management services spend. Employment effects about neutral overall.

Tribes		
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Fish Harvest		
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EXPLANATION:

Tribal harvest would be allowed as long as weak stocks were not negatively affected.

EXAMPLES:

- The Action Agencies shall work with NMFS, USFWS, and Tribal and state fishery management agencies in a multiyear program to develop, test, and deploy selective fishing methods and gear that enable fisheries to target non-listed fish while holding incidental impacts on listed fish within NMFS-defined limits. The design of this program and initial implementation (i.e., at least the testing of new gear types and methods) shall begin in FY 2001. Studies and/or pilot projects shall be under way

³BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

and/or methods deployed by the 3-year check-in. (NMFS Biological Opinion 2000 Action Table Dec. 2000)

Health		
Spirituality		
Tradition		

EXPLANATION:

Some tribes would benefit from increased utilization opportunities, especially downriver. Upriver stocks may not be improved as much, but upriver fish and wildlife opportunities should increase overall. Reservation employment opportunities associated with active restoration might increase. Overall, more opportunities than Status Quo.

Costs and Funding		
Ratepayers		

EXPLANATION:

Additional fish recovery costs paid by ratepayers. Power rates would rise, but at slower pace than Weak Stock Focus. Amount of cost passed to ratepayers could be limited by maximum sustainable revenue. Adverse effects on ratepayers.

Federal Taxpayers		
States		
Private/Commercial		

EXPLANATION:

An increase in federal funding relative to Status Quo. Greater likelihood that the ratepayers and the region would be able to finance their share of the additional expenditures. Adverse effect compared to Status Quo.

Other		
Cultural/Historical Resources		

EXPLANATION:

Similar to Status Quo. Some historical structures might be removed.

Aesthetics		
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EXPLANATION:

Little exposure of reservoir bottoms, but maybe more than Status Quo. More land in native vegetation. About the same as Status Quo.

² BPA Alternative Policy Direction: NF = Natural Focus; WS = Weak Stock; SU = Sustained Use; SS = Strong Stock; CF = Commerce Focus.

Appendix J

TYPICAL ENVIRONMENTAL CONSEQUENCES OF POTENTIAL IMPLEMENTATION ACTIONS

The following two tables provide estimates of many of the environmental consequences of potential fish and wildlife mitigation actions and program activities. The actions and activities could be implemented to benefit fish and wildlife under one or more of the alternative Policy Directions considered in this document. It should be noted that these are sample implementation actions and effects only; that is, the list is not intended to be all inclusive.

Most of the information has been developed through attempts in other EISs and fish and wildlife documents to quantify the environmental consequences using appropriate units and measures. In many cases, ranges of values provide the best available estimates for activities with varying outputs and costs. The estimates should be used for comparative purposes only; actual consequences of individual projects may vary and are expected to change over time.

The actions and activities are aligned with the major categories of environmental consequences considered in Chapter 5 of this DEIS to make it easier to cross reference.

- Table A provides estimates of fish and wildlife benefits that could result from potential implementation actions. The table also provides typical social and economic costs that could accrue from the implementation actions.
- Table B gives the typical impacts from alternative methods of energy generation that could affect air, land, and water.

The estimated environmental consequences of sample actions and activities are useful for those who may want to build their own Policy Direction alternative. The intent of this Appendix is to provide the reader with information to better understand the tradeoffs among program elements.

NOTE: All dollar values are economic costs. Most of the values are based on information in the Northwest Power Planning Council's *Human Effects Analysis of the Multi-Species Framework Alternatives* (March 2000). That analysis was itself based on secondary information from recent environmental, economic, and policy analyses in the region. A range is provided where estimates were provided for more than one location, or where multiple references were available. Many of the estimates were derived from research conducted for the Lower Snake River Juvenile Migration Feasibility Study.

Cost information in the tables pertains to the costs of fish and wildlife recovery and mitigation actions. Most hydrosystem costs are expressed as the cost per dam affected. Costs are expressed in terms of their one-time cost and the annualized equivalent. The annual equivalent was calculated assuming 4.75 percent real interest. Payment periods vary depending on the type of action, but are generally 50 years or longer. Most hydrosystem data are from the Lower Snake River Juvenile Migration Feasibility Study, the John Day feasibility study, and from federal planning documents.

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Appendix J: Typical Environmental Consequences of Potential Implementation Actions

Most habitat cost data are based on costs of agricultural and forestry practices provided by the USDA. Some habitat cost estimates are based on costs of projects funded by BPA. Cost data are generally expressed as cost per acre, though cost per mile is generally more appropriate for stream restoration practices. Cost per project is used where no better physical measure is possible.

Hatchery cost data are available from federal sources, and statistical summaries of these data yield cost per pound of fish produced. The range of costs may reflect the age and size of fish produced, different species, and different operators. Costs of actions to reduce harvest are generally based on lost net revenues in the fishing industry, but costs of targeted fisheries can be based on the costs of implementing the new practices.

The air, land, and water data came mainly from the BPA Business Plan FEIS and Resource Programs FEIS. The additional data on diesels and simple cycle combustion turbines was within the range of effects information provided in the BPEIS and has specifically been noted below to help the reader more easily see the effects.

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Social and Economic				
Agriculture, Crop Switching on Irrigated Land		50-100	\$ cost/acre irrigated	
Agriculture, Crop Management (modified cultivation practices, conservation tillage, no-till agriculture, development of small ponds to retain water)	Not quantified, Potentially major		\$ cost/acre managed	
Agriculture, Erosion Management on Dry Land		10-30	\$ cost/acre managed	USDA 1996a, 1997
Agriculture, Fallow Irrigated Land		100-300	\$ cost/acre fallow	
Agriculture, Irrigation Water Management		10-100	\$ cost/acre irrigated	USDA 1996a, 1997
Agriculture, Nutrient/Pesticide Management: Irrigated Land		5-40	\$ cost/acre managed	USDA 1996a, 1997
Agriculture, Nutrient/Pesticide Management: Dry Land		5-10	\$ cost/acre managed	USDA 1996a, 1997
Agriculture, Retire Irrigated Land	2,000-5,000	95-240	\$ cost/acre retired	

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Agriculture, Retire Dry Land/Convert to Native Vegetation	500-1,000	25-50	\$ cost/acre retired	
Agriculture, Screen Irrigation Diversions		5-47	\$ cost/cfs diversion capacity screened	USDA 1996b
Dam Breach Mainstem: Hydropower Loss		55-66 (Lower Snake Dams) 215-250 (John Day)	Million \$ cost/dam breached	USACE 1999a, 1999c
Dam Breach Mainstem: Implementation	202(Lower Snake Dams); 2,500 (John Day)	10 (Lower Snake Dams); 120 (John Day)	Million \$ cost/dam breached	USACE 1999a, 1999b
Dam Breach Mainstem: Increased Transmission Cost	120-144 (Lower Snake Dams)	5-6 (Lower Snake Dams)	Million \$ cost/dam breached	USACE 1999a
Dam Breach Mainstem: Facilities Cost Savings		Some dam modification costs would be avoided by breaching if the costs would be required for the dams that are breached	Million \$ cost saved by breaching	
Dam Breach Mainstem: Navigation Loss		25 (4 Lower Snake Dams); 95 (John Day)	Million \$ loss/group of dams) breached	USACE 1999a, 1999b
Dam Breach Mainstem: Operations and Maintenance Cost Savings		34(4 Lower Snake Dams); 10 (John Day); 10 (McNary)	Million \$ cost saved by breaching	Anderson 1999
Dam Breach Mainstem: Other Recreation Loss		8 (Lower Snake Dams)	million \$ cost/dam breached	USACE 1999a, 1999d
Dam Breach Mainstem: Recreational Fishing Loss		0.4 (Lower Snake Dams)	million \$ cost/dam breached	USACE 1999a, 1999d

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Dam Breach Mainstem: Water Supply (Irrigation) Reduction	50-61 (Lower Snake Dams) 370 (John Day); 400 (McNary)	2 (Lower Snake Dams); 20 (John Day 20 (McNary)	million \$ cost/dam breached	USACE 1999a, 1999b
Dam Breach Tributary: Hydropower Loss (Net of Expected Costs)		About zero	million \$cost/dam	
Dam Breach Tributary: Implementation Costs	10-20	0.5-1.0	million \$ cost/dam	CBB 1999a
Dam Modification: Change Dam Operations (Spills and Flows)		Depends on specifications; Changes in power, recreation, flood control, and water supply may be important		
Dam Modification: Dissolved Gas and Temperature Control	5-32	0.3-2.1	million \$ cost/dam modified	Anderson 1999
Dam Modification: Other Juvenile Transport and Bypass System Improvements	5-116	0.3-5.8	Million \$ cost/dam modified	Anderson 1999
Dam Modification: Surface Bypass Systems	50-250	2.6-13	Million \$ cost/dam modified	Anderson 1999
Dam Modification: Turbine Improvements	2-10	0.1	Million \$ cost/turbine rehabilitated (Each dam has 6-22 turbines)	Kranda 1999

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Education , Public Environmental	1,000-100,000		\$ cost/educational event	
Enforcement , Fish and Wildlife Regulations	25,000-60,000		\$ cost/person/year	
Forestry , Controlled Burn	25-56	3-6	\$ cost/acre treated	ICBEMP 2000; USDA 1996c
Forestry, Eliminate Timber Harvest	125-1,500	6-71	\$ cost/acre not harvested	ICBEMP 1997; USDA 1996c
Forestry, Limit Size of Clearcuts	<125-1,500	<6-71	\$ cost/acre of deferred harvested	ICBEMP 1997; USDA 1996c
Forestry, Reforestation	300-500	15-24	\$ cost/acre reforested	USDA 1996c
Forestry, Shelterwood/ Group Selection Harvest	50-100 + net on deferred timber harvest	56-130	\$ cost/acre treated	ICBEMP 1997
Forestry, Thinning	81		\$ cost/acre thinned	ICBEMP 2000
Habitat Improvement , Active Meander Restoration	10,000–100,000	475– 4,750	\$ cost/acre restored	BPA 1999
Habitat Improvement, Channel Modification (Substrate, configuration, reconnect side channels, etc.)	9,000–100,000	475– 4,750	\$ cost/mile of stream modified	BPA 1999; ICBEMP 2000
Habitat Improvement, Construct/Restore Wetlands	2,000-10,000	100– 470	\$ cost/acre constructed	USDA 1996b

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Habitat Improvement, Dike Removal in Estuary	Not quantified, potentially significant		\$ cost/mile of dike removed	
Habitat Improvement, Floodplain Structure Buyback			\$ cost/property purchased	
Habitat Improvement, Instream Structures	30,000	1,425	\$ cost/mile of stream modified	BPA 1999
Habitat Improvement, Monitoring (Improve environmental data management systems)		25,000-60,000	\$ cost/person/year	
Habitat Improvement, Reconnect Aquatic Habitats	9,000–100,000	475– 4,750	\$ cost/project	BPA 1999; ICBEMP 2000
Habitat Improvement, Remove Passage Obstruction (Culverts, low-head dams, weirs)	5,000-50,000	240–2,400	\$ cost/obstruction removed	BPA 1999
Habitat Improvement, Research	10,000-300,000		\$ cost/research project	
Habitat Improvement, Riparian Restoration	300		\$ cost/acre of riparian area improved	ICBEMP 2000
Habitat Improvement, Road Management (Upgrades, maintenance, closing, and removing roads)	5,800		\$ cost/mile of road treated	ICBEMP 2000

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Habitat Improvement, Utility and Transportation Corridors (Adjust vegetation management and maintenance)	Not quantified, potentially significant		\$ cost/mile of corridor adjusted	
Habitat Improvement, Water Rights Purchase (1 Million Acre-Feet of Water from Upper Snake River)		75-85	Million \$ total cost	BOR 1999
Habitat Improvement, Wildlife Habitat (Seral stages, snags, downed wood, large trees, and preferred species)	44	2.3	\$ cost/acre treated	ICBEMP 2000
Hatcheries , Construct New Facilities	20-40	1-2	Million \$ cost/hatchery	Radtke & Davis 1997
Hatcheries, Demolition/Decommissioning	50,000-200,000	2.6-10.5	Thousand \$ cost/hatchery	
Hatcheries, Increase Fish Production in Existing Facilities		2-6	\$ cost/pound of smolts	Radtke & Davis 1997
Hatcheries, Increase Fish Production in New Facilities (including O&M)		7-10	\$ cost/pound of smolts	Radtke & Davis 1997
Power , Build Replacement Generation Facilities	Varies, may be significant	Varies, may be significant	\$/aMW	

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Power, New Transmission Line Right-of-Way	2.7-4.4		ha dedicated to ROW/km of transmission line	BPA 1993
Rangeland , Exclude Grazing from Riparian Zone		10-20	\$ cost/acre excluded	USDA 1996a
Rangeland, Improvements/Restoration	50		\$ cost/acre treated	ICBEMP 2000
Rangeland, Manage/ Eliminate Grazing (Seasonal or rotational grazing, reduced grazing intensity, deferred grazing)		1-5	\$ cost/acre excluded	USDA 1996b
Rangeland, Noxious Weed Treatments	30	2.4	\$ cost/acre treated	ICBEMP 2000
Rangeland, Retire Rangeland	100-500	5-47	\$ cost/acre retired	USDA 1996a, 1996b, 1997
Recreation , Controlled Recreation Intensity or Rotational Use	Varies, may be significant			
Recreation, Relocate Facilities Away from Sensitive Habitats	125-1,500	6-71	\$ cost/acre not used	
Recreation, River (Floating, viewing, hiking)	71-297		\$/river trip	Loomis 1999 in USACE 1999a

Table A - Typical Fish and Wildlife Social and Economic Consequences, of Implementation Actions.

Action/Activity	Environmental Effect	Annualized Environmental Effect	Unit of Measure	Reference
Urban and Rural Development, Acquisition of Conservation Easements	1-100	.05-47	Thousand \$/acre of easement acquired	
Urban and Rural Development, Improve Stormwater Treatment	1,000 - 3,000	50 – 150	\$ cost/acre-foot of water treated	
Urban and Rural Development, Improve Wastewater Treatment	0.01-10	0.0005-.5	Million \$/project	

Table B - Typical Impacts to Air, Land, and Water from Alternative Methods of Energy Generation.

Types of Energy Conservation and Generation	Air Emissions					PAHs	Water Consumed --yd ³ /aMW--	Land Area Consumed --ac./aMW--
	SO ₂	NO _x	CO ₂ -- tons/aMW --	Particulates	CO			
Energy Conservation ^a	0.0	0.0	0	0.0	0.0		0	0.0
Power Efficiency Improvements ^a	0.0	0.0	0	0.0	0.0		0	0.0
Renewable Energy ^a								
Geothermal	0.8 H ₂ S	0.0	636	0.0	0.0		72,277	0.3
Solar	0.0	0.0	0	0.0	0.0		629	6.0
Wind	0.0	0.0	0	0.0	0.0		0	23.6
Hydro	0.0	0.0	0	0.0	0.0		0	0.0
Cogeneration ^a								
Solid Waste-Fired	13.6	70.2	13,256	3.0	2.7	+	0	2.0
Wood-Fired	0.5	9.0	11,959	1.7	17.0	+	87,604	2.6
Existing Natural Gas-Fired	0.0	5.3	3,542	0.0	2.0	+	5,486	0.2
Natural Gas Combustion Turbine ^{ab}								
Older	0.0-43.9	4.6-15.0	3,542-5,142	0.0-0.3	0.7-3.8	+	5,486	0.2
Newer	0.0-0.3	0.4-4.9	3,313	0.2	0.1-5.9	+	5,486	0.2
Natural Gas Reciprocating Engines (with NO _x control) ^b	0.0	1.3-2.5	--	1.1-1.2	3.7-3.8	+	--	--
Large Stationary Diesel Engines ^c	1.9-47.2		7,713	1.4-4.7	2.5-39.7	+	--	--
Without NO _x Control		149.6						
With NO _x Control		14.3-88.8						
Stationary Dual Fuel (5% diesel, 95% natural gas uncontrolled for NO _x) Engines ^c	0.2	105.5	--	--	44.2	+	--	--
Nuclear Energy ^a	0.0	0.0	0	0.0	0.0		25,814	2.2
Coal ^a								
Common	8.6	21.6	8,843	1.3	1.5	+	17,247	1.3
Clean Fluidized-Bed Coal	3.1	5.3	8,052	0.6	1.4	+	26,507	1.6
Clean Gasification Coal	1.5	3.9	7,551	0.2	0.1	+	26,232	0.7
Fuel Switching (Gas water heaters and furnaces) ^a	0.0	2.4	2,550	0.0	1.1	+	0	0.0
Power Purchases (Assumed all combustion turbines) ^a	0.0	5.3	3,542	0.0	2.0	+	5,486	0.2

^a BPA 1993; ^b EPA 2000; ^c EPA 1996

+ = Present in emissions from incomplete combustion

-- = No data

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Appendix J: Typical Environmental Consequences of Potential Implementation Actions

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